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The Fourth Amendment's probable cause requirement is not about numbers or statistics. It is about requiring the police to account for their decisions. For a theory of wrongdoing to satisfy probable cause—and warrant a search or seizure—it must be plausible. The police must be able to explain why the observed facts invite an inference of wrongdoing, and judges must have an opportunity to scrutinize that explanation.

Until recently, the explanatory aspect of Fourth Amendment suspicion—"plausible cause"—has been uncontroversial, and central to the Supreme Court's jurisprudence, for a simple reason: explanations have served, in practice, as a guarantor of statistical likelihood. In other words, forcing police to articulate theories of wrongdoing is the means by which courts have traditionally ensured that (roughly) the right "persons, houses, papers, and effects" are targeted for intrusion. Going forward, however, technological change promises to disrupt the harmony between explanatory standards and statistical accuracy. Powerful machines enable a previously impossible combination: accurate predictions unaccompanied by explanations. As that change takes hold, we will need to think carefully about why explanation-giving matters. When judges assess the sufficiency of explanations offered by police

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(and other officials), what are they doing? If the answer comes back to error-reduction—if the point of judicial oversight is simply to maximize the overall number of accurate decisions—machines could theoretically do the job as well as, if not better than, humans. But if the answer involves normative goals beyond error-reduction, automated tools—no matter their power—will remain, at best, partial substitutes for judicial scrutiny.

This Article defends the latter view. I argue that statistical accuracy, though important, is not the crux of explanation-giving. Rather, explanatory standards—like probable cause—hold officials accountable to a plurality of sometimes-conflicting constitutional and rule-of-law values that, in our legal system, bound the scope of legitimate authority. Error-reduction is one such value. But there are many others, and sometimes the values work at cross purposes. When judges assess explanations, they navigate a space of value-pluralism: they identify which values are at stake in a given decisional environment and ask, where necessary, if those values have been properly balanced. Unexplained decisions render this process impossible and, in so doing, hobble the judicial role. Ultimately, that role has less to do with analytic power than practiced wisdom. A common argument against replacing judges, and other human experts, with intelligent machines is that machines are not (yet) intelligent enough to take up the mantle. In the age of powerful algorithms, however, this turns out to be a weak—and temporally limited—claim. The better argument, I suggest in closing, is that judging is not solely, or even primarily, about intelligence. It is about prudence.

INTRODUCTION

Suppose, in the near future, that police start using an algorithmic tool—the Contraband Detector—to locate residences likely to contain illegal weapons. When the tool was first developed, its outputs were thirty percent accurate. With time, however, machine learning refined the tool.[1] Now its accuracy rate hovers around eighty percent, and data scientists, having recently "audited" the Contraband Detector,[2] report that the tool's performance will only continue to improve. When the tool locates a suspicious residence, it does not explain why; it simply displays an address. And because of the tool's complexity—it draws on more than one hundred input-variables—officers have no idea which variables are determinative in a given case.[3]

Here is the puzzle. Imagine the Contraband Detector, deployed in New York City, turns up "285 Court St., Apt. 2L," prompting the NYPD to seek a search warrant. When the judge asks about probable cause, the officers point to one, and only one, fact: the tool's performance rate.[4] Should the judge sign the warrant? Or better yet: Could the judge's role in the process simply be eliminated—at least in principle—such that any time the tool identifies a suspicious residence,

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1. For background, see, for example, Harry Surden, *Machine Learning and the Law*, 89 WASH. L. REV. 87, 89 (2014) (explaining that " '[m]achine learning' refers to a subfield of computer science concerned with computer programs . . . [that] are capable of changing their behavior to enhance their performance on some task through experience"); and *id.* at 90–95 and accompanying notes (elaborating the techniques behind machine learning, and discussing spam filters as a case study).

2. *See* Joshua A. Kroll et al., *Accountable Algorithms*, 165 U. PA. L. REV. 633 (2017) (arguing that the use of computer systems and algorithms in governance should involve accountability and oversight).

3. I borrow here from Orin Kerr's well-known "Harvard dorm room" hypothetical, which imagines "a scientific study by top Harvard scientists showing that marijuana can be found in 60% of Harvard dormitory rooms," and asks whether the study's finding, standing alone, generates cause to search any given dorm room. *See* Orin Kerr, *Why Courts Should Not Quantify Probable Cause*, *in* THE POLITICAL HEART OF CRIMINAL PROCEDURE: ESSAYS ON THEMES OF WILLIAM J. STUNTZ 131, 135–37 (Michael Klarman, David Skeel & Carol Steiker eds., 2012); *see also* Jane Bambauer, *Hassle*, 113 MICH. L. REV. 461, 462 n.2 (2015) (modifying Kerr's hypothetical—as I do—to make the selection of a specific target genuinely random, rather than deliberate but underdetermined).

4. It bears noting that the performance of a detection tool (like the Contraband Detector) can be measured along multiple dimensions, and I am focusing here on what statisticians call "precision": comparing a detection method's true-positive rate to its false-positive rate. Another dimension of accuracy is "sensitivity": comparing a detection method's true-positive rate to its false-negative rate. Whereas precision focuses on how often a detection method makes improper selections, sensitivity focuses on how often a method neglects to make *proper* selections. *See* RICARDO BAEZA-YATES & BERTHIER RIBEIRO-NETO, MODERN INFORMATION RETRIEVAL (2d ed. 2011) (discussing computer-centered information retrieval). In Fourth Amendment law, we are often unconcerned with false-negatives, because false-negatives by their nature involve no intrusion. From an overall governance perspective, however, the distinction is important; sensitivity often implicates equality and neutrality concerns that precision does not.

a search warrant issues automatically?[5] In other words, suppose the next generation of tool, operating on the same logic, is not a Contraband Detector, but an Automatic Warrant Machine. Assuming the tool continues to perform at a high level of statistical precision, would its use—in lieu of judicial oversight—be consistent with the Fourth Amendment?

There is a powerful and widespread intuition that the answer to these questions is no.[6] Performance aside, blind reliance on an algorithmic tool feels uncomfortable. It misses the point of particularized suspicion.[7] But why? On its face, probable cause would seem to depend on the *probability* that a "person[ ], house[ ], paper[ ] or effect[ ]" is linked to wrongdoing.[8] In the example, it is eighty percent

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5. *Cf.* Betsy Cooper, *Judges in* Jeopardy!*: Could IBM's Watson Beat Courts at Their Own Game?*, 121 YALE L.J. ONLINE 87, 96–99 (2011) (exploring the advantages and drawbacks of having machine learning programs hypothetically replace textualist judges).

6. *See* Kerr, *supra* note 3 (arguing against the quantification of probable cause); Michael L. Rich, *Machine Learning, Automated Suspicion Algorithms, and the Fourth Amendment*, 164 U. PA. L. REV. 871, 898–901 (2016) (arguing that purely algorithmic inferences of suspicion defy the "totality-of-the-circumstances" ideal); *see also* Bruce A. Antkowiak, *Saving Probable Cause*, 40 SUFFOLK U. L. REV. 569, 586 (2007) (arguing for skepticism about using "mathematical concepts to solve the probable cause riddle"); *cf.* Laurence H. Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329, 1330–31 (1971) (defending the value of human intelligibility in the trial process).

7. *See* Ronald J. Bacigal, *Making the Right Gamble: The Odds on Probable Cause*, 74 MISS. L.J. 279, 295–96 (2004) (noting the law's "[discomfort] with relying wholly on base rates and making the leap from aggregate likelihood to a conclusion of probable cause in a specific case," despite the epistemic equivalence—at some level—of base rate evidence, on the one hand, and "individuating" evidence, on the other); Sherry F. Colb, *Probabilities in Probable Cause and Beyond: Statistical Versus Concrete Harms*, 73 LAW & CONTEMP. PROBS. 69, 71–78 (2010) (suggesting that suspicion ceases to seem individualized if false-positives are treated as an anticipated statistical category, rather than the outcome of isolated errors); Andrew Guthrie Ferguson, *Big Data and Predictive Reasonable Suspicion*, 163 U. PA. L. REV. 327, 331 (2015) (suggesting that predictive policing represents a departure from the traditional, "small data" notion of suspicion as stemming from the "specific, observable actions of unknown suspects"); *cf.* Ronald J. Allen, *On the Significance of Batting Averages and Strikeout Totals: A Clarification of the "Naked Statistical Evidence" Debate, the Meaning of "Evidence," and the Requirement of Proof Beyond A Reasonable Doubt*, 65 TUL. L. REV. 1093, 1104 (1991) (arguing that statistical approaches to guilt—at trial—feel uncomfortable because statistics cannot assure a fact-finder that no plausible innocent explanation of the observed facts exists).

8. *See* U.S. CONST. amend. IV (protecting "[t]he right of the people to be secure in their persons, houses, papers, and effects"). A number of scholars have recently taken up the banner of probability-based probable cause—often in the hope of revitalizing Fourth Amendment protection. *See* CHRISTOPHER SLOBOGIN, PRIVACY AT RISK: THE NEW GOVERNMENT SURVEILLANCE AND THE FOURTH AMENDMENT 37–46 (2007) (proposing a proportionality analysis for determining the level of suspicion necessary for searches and seizure); Bambauer, *supra* note 3, at 483 (arguing that courts should evaluate individualized suspicion based on the "hassle" rate of a given search or seizure); Bernard E. Harcourt & Tracey L. Meares, *Randomization and the Fourth Amendment*, 78 U. CHI. L. REV. 809, 811 (2011) (promoting randomization as the "lodestar" for Fourth Amendment reasonableness); Ric Simmons, *Quantifying Criminal Procedure: How to Unlock the Potential of Big Data in Our Criminal Justice System*, 2016 MICH. ST. L. REV 947, 951 (promoting the use of big data in the criminal justice system for determinations of both probable cause and reasonable suspicion). I disagree with these accounts to the extent they reduce suspicion

probable that 285 Court St., Apt. 2L contains an illegal weapon. So probable cause, literally construed, should be satisfied.

I propose a simple solution to this puzzle. For probable cause to be satisfied, an inference of wrongdoing must be *plausible*—the police must be able to explain why observed facts give rise to the inference.[9] And judges must have an opportunity to scrutinize that explanation: to test its overall intelligibility; to weigh it against the best innocent account on the other side; and to evaluate its consistency with background values, flowing from the Constitution, from general legality principles, and from other sources of positive law.[10]

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exclusively to statistical measures. *See infra* Part III. Whether this is true of each specific account is not entirely clear. Some scholars are openly enthusiastic about allowing statistical measures to supplant explanations. *See, e.g.*, Harcourt & Meares, *supra*, at 811 ("We contend that the model of the randomized checkpoint should serve as the lodestar for reasonableness . . . and that the concept of 'individualized suspicion' should be abandoned."). Other scholars are interested in normative values—for example, keeping suspicion requirements proportional to both the state interest and intrusion involved—that seem to entail a statistical approach. *See, e.g.*, SLOBOGIN, *supra*, at 21 (advancing the "proportionality principle" as the way to conceptualize the reasonableness of a search or seizure).

9. The distinction between probability and plausibility, as I am using it, focuses on the difference between *prediction* and *explanation*. To ask whether an inference is probable is to assess its numerical likelihood, in light of known facts—in principle, this interpretive task can be performed without an observer understanding why an inference is likely (or unlikely). To ask whether an inference is plausible, by contrast, is to inquire about its explanatory power: Would Inference *X*, if true, explain the existence of known facts? This interpretive task depends on an understanding of the relationship between an inference and background facts. For further background on the distinction, see Michael S. Pardo & Ronald J. Allen, *Juridical Proof and the Best Explanation*, 27 LAW & PHIL. 223, 224 (2008) (discussing inference practices in juridical proof); and *infra* Part I. For background on the specific context of pleading doctrine, see Kiel Brennan-Marquez, *The Epistemology of* Twombly *and* Iqbal, 26 REGENT U. L. REV. 167, 172–73 (2013) (arguing that the difference between "probable" and "plausible," is a matter of category, not degree, and that the latter demands abductive—as opposed to purely inductive—reasoning); see also John R. Josephson, *On the Proof Dynamics of Inference to the Best Explanation*, 22 CARDOZO L. REV. 1621, 1622–25 (2001) (providing an overview of abductive reasoning). For background in the specific context of guilt determinations, see Ronald J. Allen & Alex Stein, *Evidence, Probability, and the Burden of Proof*, 55 ARIZ. L. REV. 557, 560 (2013) (discussing mathematical probability and the burden of proof); and Michael S. Pardo, *The Nature and Purpose of Evidence Theory*, 66 VAND. L. REV. 547, 557–58 (2013) (discussing "theoretical accounts of evidence and proof").

10. Whether probable cause *also* requires that inferences of wrongdoing be probable in a numerical sense is an interesting normative question, and one that I leave largely to one side in this Article. For the moment, suffice it to say that nothing in the history of the Fourth Amendment, nor in existing doctrine, suggests that mathematical notions of probability play a role in the analysis. On the historical point, see, for example, Hon. Ronald M. Gould & Simon Stern, *Catastrophic Threats and the Fourth Amendment*, 77 S. CAL. L. REV. 777, 788–89 (2004) (explaining that in old English, the term "probable" was more synonymous to "provable" than to "statistically likely," or put otherwise, that "probable" applied in old English to propositions that a reasonable person would have "good cause" to believe); and Joseph D. Grano, *Probable Cause and Common Sense: A Reply to the Critics of* Illinois v. Gates, 17 U. MICH. J.L. REFORM 465, 490–91 (1984) (arguing that historically, in both English cases and early U.S. Supreme Court cases, an official's having "probable cause" was understood to mean that he had "reasonable grounds for believing" that wrongdoing had occurred). This historical evidence has not deterred scholars from talking about probable cause in terms of statistical probability. In fact, the standard is frequently described that way—as a quantitative standard, reducible, in principle, to numerical benchmarks.

This hardly means that prediction tools have no place in policing or in other areas of governance. It means, rather, that their role is to aid human reasoning, not to supplant it.[11] Outputs from prediction tools, like outputs from other detection instruments, such as drug dogs,[12] can certainly be among the facts that police adduce—in an explanatory fashion—to anchor claims of wrongdoing. For that process to work, however, a tool's outputs must be intelligible. Black-box tools will not do. Nor will transparent tools with outputs too complex for a human to trace.[13]

Although the Contraband Detector, as imagined, exceeds current technology, the trend it reflects—the blossoming of data-driven prediction tools in the criminal justice system—is hardly science fiction. In many jurisdictions, judges have already begun to rely heavily on prediction tools that predict the likelihood of flight or recidivism for bail and sentencing purposes,[14] a practice recently upheld by the Wisconsin

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See, e.g., Ferguson, *supra* note 7, at 331–32 (arguing that reasonable suspicion, construed in terms of probability, is a "small data doctrine," which "may become practically irrelevant in an era of big data policing"); Erica Goldberg, *Getting Beyond Intuition in the Probable Cause Inquiry*, 17 LEWIS & CLARK L. REV. 789, 791 (2013) (arguing that probable cause can—and should—be cast in quantitative, probabilistic terms, at least in the "[growing] subset of cases . . . where the police rely on machines or tools . . . to create their suspicion"); Craig S. Lerner, *The Reasonableness of Probable Cause*, 81 TEX. L. REV. 951, 994–95 (2003) (suggesting that scholars share an "impression" that probable cause is "amenable to mathematical form"); Max Minzner, *Putting Probability Back into Probable Cause*, 87 TEX. L. REV. 913, 915–16 (2009) (arguing for use of statistical measures like success rates in the probable cause analysis); Andrew E. Taslitz, *Foreword: The Death of Probable Cause*, LAW & CONTEMP. PROBS., Summer 2010, at i, ii (2010) (arguing that "[a]lthough it is hard to describe standards of proof like that embodied in the phrase 'probable cause' in purely mathematical terms, judges and scholars have long [sought] rough mathematical approximations of the standard"); *id.* at ii nn.4–7 (compiling sources).

11. *See, e.g.*, HUBERT L. DREYFUS, WHAT COMPUTERS *STILL* CAN'T DO: A CRITIQUE OF ARTIFICIAL REASON (1992) (critiquing artificial intelligence); JOSEPH WEIZENBAUM, COMPUTER POWER AND HUMAN REASON: FROM JUDGMENT TO CALCULATION (1976) (discussing problems with computers as a substitute for human knowledge). For an overview of contemporary debates focused on a similar issue—the question of whether to keep humans "in the loop," in the context of automated warfare—see Rebecca Crootof, *A Meaningful Floor for "Meaningful Human Control,"* 30 TEMP. INT'L & COMP. L.J. 53, 54 (2016) (discussing whether "meaningful human control" requires human decisionmaking to occur "in the loop," "on the loop," or "off the loop"); Markus Wagner, *Taking Humans Out of the Loop: Implications for International Humanitarian Law*, 21 J.L. INFO. & SCI. 155, 159–60 & nn.19–22 (2011) (discussing humanitarian law and "the [considerable] requirements for autonomous weapon systems").

12. *See infra* Section II.B.

13. *See generally* FRANK PASQUALE, THE BLACK BOX SOCIETY: THE SECRET ALGORITHMS THAT CONTROL MONEY AND INFORMATION (2015) (discussing the impact of big data). The issue of what, precisely, it means for algorithmic outputs to be traceable is an immensely complicated one, which I largely reserve for future work. For background, see Jenna Burrell, *How the Machine "Thinks": Understanding Opacity in Machine Learning Algorithms*, 3 BIG DATA & SOC'Y 1, 1 (2016) (discussing the problem of opacity for machine learning algorithms).

14. *See* Julia Angwin, Jeff Larson, Surya Mattu & Lauren Kirchner, *Machine Bias*, PROPUBLICA (May 23, 2016), https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing [https://perma.cc/76FL-XVUN] (exploring how data-driven prediction tools are currently being used at the sentencing stage); Vivian Ho, *Seeking A Better Bail System, SF*

Supreme Court.[15] Likewise, the first wave of suspicion tools have recently been adopted by police departments, often to help officers assess individuals' "threat scores" while on patrol.[16] At present, the technology is crude; no hyper-precise detection tool, able to predict the presence of contraband eighty percent of the time, yet exists. But this will not be true for long. The next generation of "threat score" tools may well resemble the Contraband Detector. The one after that may surpass it.

This impending reality prompts an important set of questions. As I show in Part II, the Supreme Court has long understood probable cause (as well as its sibling requirement, reasonable suspicion) in explanatory terms. Existing case law focuses on whether police have articulated—or could have articulated—a convincing theory of wrongdoing. If machines become capable of predicting criminal activity more acutely than judges and police officers, however, of what use are intelligible theories? If explanations no longer facilitate statistical accuracy—if, indeed, they stand to *impede* statistical accuracy—why should we continue to insist on them?[17]

In recent years, there has been no shortage of commentary calling for greater regulation of the often-opaque, often-proprietary algorithms that increasingly shape our fates. But commentary has focused mostly on the risk of error—algorithmic inaccuracy—as its normative motivation. Algorithms are cause for concern, the argument goes, insofar as they make mistakes, and the reason algorithms must be accountable to human understanding (the argument continues) is to avoid those mistakes. This logic is discernible in both scholarship on Fourth Amendment law specifically and scholarship on due process writ large.[18] But as algorithms improve, this logic wears thin. Indeed, it

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Turns to Computer Algorithm, S.F. CHRON. (Aug. 1, 2016), http://www.sfchronicle.com/crime/article/Seeking-a-better-bail-system-SF-turns-to-8899654.php [https://perma.cc/QXM8-8ZKR].

15. *See* State v. Loomis, 881 N.W.2d 749 (Wis. 2016).

16. *See, e.g.*, Justin Jouvenal, *The New Way Police Are Surveilling You: Calculating Your Threat 'Score,'* WASH. POST (Jan. 10, 2016), https://www.washingtonpost.com/local/public-safety/the-new-way-police-are-surveilling-you-calculating-your-threat-score/2016/01/10/e42bccac-8e15-11e5-baf4-bdf37355da0c_story.html?utm_term=.c765ff7bcf09 [https://perma.cc/HFY5-U47E].

17. Policing is not the only realm in which machine learning brings normative controversy to the surface. In the employment discrimination setting, machine learning is upending the foundations of the "disparate impact" doctrine. *See, e.g.*, Solon Barocas & Andrew D. Selbst, *Big Data's Disparate Impact*, 104 CALIF. L. REV. 671 (2016). And machine learning is also forcing us to decide what inputs are appropriate for making sensitive distributive decisions. *See, e.g.*, Rick Swedloff, *Risk Classification's Big Data (R)evolution*, 21 CONN. INS. L.J. 339 (2015) (exploring this problem in the insurance context).

18. On the Fourth Amendment side, see Kerr, *supra* note 3, at 137–38 (arguing that suspicion decisions are best left to "instinct" and "intuition," because judges are skilled at "get[ting] a feeling," in context, that something is amiss about a given claim of suspicion—e.g., that law enforcement is omitting relevant information—or, likewise, that additional evidence is necessary

becomes self-defeating. If statistical accuracy is ultimately what matters, it may soon be humans that require oversight *by machines*, not the other way around.

In this Article, I will argue—using probable cause as the case study—that explanatory standards vindicate goals apart from accuracy by enabling judges, as supervisors of state power, to navigate value-pluralism. In the Fourth Amendment context and elsewhere, requiring state actors to explain their decisions enables judges (1) to consider the plurality of values implicated by the exercise of state power and (2) to resolve conflicts between those values in a context-sensitive way. At day's end, the rationale for individualized review, costly and inefficient as it may be, is that in some settings *we cannot be sure in advance which values will be implicated by the exercise of power*. And when that is true, decisionmaking resists automation. Decisions must be subject—or at least susceptible—to case-by-case evaluation in order to ensure that no particular value or set of values subsumes others. Naturally, to say that we entrust judges with this task does not mean other mechanisms of governance are irrelevant; on the contrary, administrative regulation and democratic oversight (often intertwined) also have an important

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to clear the evidentiary hurdle); and Rich, *supra* note 6, at 897–901 (arguing that humans can "always at least potentially . . . includ[e] a new piece of relevant information in an analysis," and that this makes them better at performing suspicion decisions, since an algorithm, due to its necessarily limited training, "cannot consider the 'whole picture' regarding a person's potential criminality as required by the Fourth Amendment"). On the due process side, see PASQUALE, *supra* note 13, at 18 (summarizing the book's normative ambition by warning that without robust oversight for algorithms, "[f]aulty data, invalid assumptions, and defective models"—in other words, inaccuracy—will reign supreme); Danielle Keats Citron, *Technological Due Process*, 85 WASH. U. L. REV. 1249, 1256–57 (2008) (enumerating algorithmic governance tools that have been prone to error, including (1) "[b]enefit [m]anagement [s]ystems" that have issued "hundreds of thousands of incorrect Medicaid, food stamp, and welfare eligibility determinations," (2) algorithms meant to locate " 'dead-beat' parents who owe child support" that sweep in many non-offenders, triggering automatic garnishment of wages, and (3) counterterrorism tools that, due to "[u]nsophisticated algorithms and faulty data," end up "generat[ing] high rates of false positives" with grave law enforcement consequences); and Kate Crawford & Jason Schulz, *Big Data and Due Process: Toward A Framework to Redress Predictive Privacy Harms*, 55 B.C. L. REV. 93, 119 (2014) (explaining that "[f]or Big Data to deliver the answers we seek, it must be accurate and include all appropriate inputs equally to overcome any signal problems"). The core principle here—that the main goal of procedural protections is to reduce error—is nothing new. *Goldberg v. Kelly*, 397 U.S. 254, 267 (1970), arguably the high-water mark of constitutional procedure, described pre-termination hearings for welfare recipients (which the Court ultimately held to be necessary under the Due Process Clause), as serving "one function only: to produce an initial determination of the validity of the welfare department's grounds for discontinuance of payments in order to protect a recipient against an erroneous termination of his benefits." Furthermore, among scholars, the focus on accuracy reaches back to Larry Tribe's famous meditation on statistical analysis in law, which spawned an entire genre of scholarship in the 1980s and 1990s about the virtues and shortcomings of making legal proof more "precise" via mathematics. *See* Tribe, *supra* note 6. Tribe's analysis focused primarily on accuracy. He worried, for example, that incorporating mathematical formulas into jury deliberations would cause human decisionmakers to "ask[ ] the wrong questions," to unduly discount the value of "soft variables," and to give short shrift to "mathematical prior[s]." *Id.* at 1359, 1361, 1365.

role to play in managing value-pluralism.[19] Indeed, as I explain in Part IV, explanatory standards are often important, quite apart from facilitating case-specific review, for the information they yield. In areas like policing, where enforcement priorities are often opaque to public view, explanatory standards are a window into practices on the ground.

Specifically, I identify two sets of values that trade off, in some cases, against statistical accuracy and that judges should have an opportunity to consider as they supervise the police. The first are values enshrined in specific constitutional prohibitions. Selecting law enforcement targets on the basis of race or religion, for example, raises Equal Protection and First Amendment values quite independent of the statistical accuracy of the decisions. In other words, *even if* race or religion (perhaps combined with other data) turned out to be a powerful proxy for criminal activity, the use of these variables would be disquieting, and more exacting scrutiny would be appropriate. Likewise, if associational data—e.g., membership in a political organization—were the main basis of suspicion, First Amendment values would counsel in favor of caution.

The second set of values that trade off against accuracy consist of "legality" principles, which often find doctrinal anchor in the Due Process Clause. I focus in particular on the prohibition against vagueness and the notion of "fair notice" in criminal law, which entail that seemingly lawful conduct should be presumed lawful-in-fact, unless the state can convincingly suggest otherwise. I call this the "other side of the story" principle: to justify intrusion, law enforcement's theory of wrongdoing must be capable of dislodging the most plausible innocent version of events on the other side—the version a suspect herself might offer, if the proceeding was adversarial. In keeping with the Supreme Court's vagueness jurisprudence, this requirement serves two goals at once. First, it allows people to predict, to some extent at least, what types of conduct invite intrusion. Second, and more crucially, it "[dis]courage[s] arbitrary and discriminatory enforcement [of the law]."[20] This last point is especially important, because it highlights the "disciplining" role of explanatory standards. When officials know they will have to account for their decisions, that knowledge, by itself, has a salutary effect on official psychology and behavior. Long before judicial scrutiny actually occurs, in other words, the benefits of explanation-giving accrue upstream: it causes officials to monitor *themselves* and—ideally—to internalize the constitutional limits and legality principles just explored.

19. *See infra* note 109 and accompanying text.

20. Kolender v. Lawson, 461 U.S. 352, 357 (1983).

Navigating the tension between these values is a critical aspect of judicial review—indeed, of all governance—and more importantly, as I suggest in Part V, it is the aspect of judicial review least amenable to automation. This does not mean that all suspicion decisions implicate all of the non-accuracy values just discussed. Many, in fact, implicate none of them. In the great run of cases, suspicion decisions are based on theories of wrongdoing that rely on no sensitive variables, and that readily comport with rule-of-law principles. In those cases, it is conceivable that, in theory, automation would be appropriate. The problem is that not all cases are this way. At times, values beyond accuracy become relevant, and the resulting pluralism is not one that we can trust machines—bound as they are by the formal limits of their training—to navigate. Case-based oversight is needed. And for that, explanations are indispensable.

One final note before jumping in. Although my doctrinal prism here is Fourth Amendment suspicion, the normative question is not so limited. After laying out the explanatory model of probable cause in Parts I, II, and III, I endeavor in Parts IV and V to develop a more general argument about explanatory standards and judicial review in the age of powerful machines. Ultimately, to demand that state officials explain their decisions is to make a simple, but profound, claim about the legitimate exercise of state power. The question is whether that claim can be reduced to statistical outcomes. In many contexts—certainly in the policing context—the answer is no.

I. PROBABILITY V. PLAUSIBILITY, PREDICTION V. EXPLANATION

Probability and plausibility are different metrics for assessing the strength of an inference drawn from observed facts. Probability is about predictive likelihood. Past observations can be extrapolated to new data: based on "the general frequencies of events,"[21] we can predict the odds that a particular inference is true.[22] This certainly happened before the rise of big data; we do it all the time in everyday life. But machine learning has intensified the process. Today, prediction is more powerful—and possible in more domains—than ever before.[23]

Plausibility, by contrast, is about explanatory power.[24] All

21. Allen & Stein, *supra* note 9, at 560.

22. For background on conditional probability—and Bayesian reasoning writ large—see Maggie Wittlin, *Hindsight Evidence*, 116 COLUM. L. REV. 1323, 1334–41 (2016).

23. *See, e.g.*, PASQUALE, *supra* note 13.

24. This conception of plausibility, as distinct from probability, has surfaced previously in two other areas. The first is pleading doctrine. *See* Brennan-Marquez, *supra* note 9, at 191 (arguing that plausibility analysis, per *Iqbal* and *Twombly*, is not a less exacting species of probability, but

observed facts invite many possible inferences as to what brought the facts about. For Inference *A* to be plausible, it must provide an explanation of observed facts that meshes with an observer's understanding of the world.[25] Moreover, whether Inference *A* is more plausible than Inference *B* (or vice versa) depends on which inference supplies the *better* explanation: which inference is simpler, consistent with a greater share of facts, and more compatible with "background beliefs."[26] Inference *A* is relatively plausible if, in comparison to other

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an epistemologically distinct question of whether the "hypothesis of illegal behavior"—as stated in the complaint—is superior, in an explanatory sense, to "readily imaginable hypothesis of legal behavior" that are also consistent with alleged facts); *see also* Bell Atl. Corp. v. Twombly, 550 U.S. 544, 557, 567 (2007) (glossing the plausibility standard by explaining that the alleged facts must "plausibly suggest[ ]" wrongdoing, "not merely [be] *consistent with*" wrongdoing, since the latter could admit of an "obvious alternative [legal] explanation" (emphasis added)); A. Benjamin Spencer, *Understanding Pleading Doctrine*, 108 MICH. L. REV. 1, 6, 15 (2009) (explaining that complaints fail to allege plausible entitlements to relief if "lawful reasons could explain factual occurrences reported in a complaint just as well as unlawful ones might"). For an interesting judicial take on the relationship between Fourth Amendment suspicion standards and pleading doctrine, see *Tellabs, Inc. v. Makor Issues & Rights, Ltd.*, 551 U.S. 308, 336 (2007) (Stevens, J., dissenting) (arguing that the PLSRA's heightened pleading requirements should be construed as akin to "probable cause"). The second is commentary on the epistemology of guilt determinations. *See, e.g.*, Pardo, *supra* note 9; Pardo & Allen, *supra* note 9; *see also* Nancy Pennington & Reid Hastie, *A Cognitive Theory of Juror Decision Making: The Story Model*, 13 CARDOZO L. REV. 519 (1991). For defenses of the probability view, see LARRY LAUDAN, TRUTH, ERROR, AND CRIMINAL LAW (2006); and Daniel Shaviro, *Statistical-Probability Evidence and the Appearance of Justice*, 103 HARV. L. REV. 530 (1989). For an overview of the tension, see Edward K. Cheng, *Reconceptualizing the Burden of Proof*, 122 YALE L.J. 1254, 1256–59 (2013).

25. *See, e.g.*, Brennan-Marquez, *supra* note 9, at 172 nn.17–20 and accompanying text (explaining that plausibility determinations depend on evaluating competing inferences against the backdrop of "what is natural" and what is not). The understanding of plausibility has much in common with the idea of "causative probability," developed most systematically by Alex Stein. *See* Alex Stein, *The Flawed Probabilistic Foundation of Law and Economics*, 105 NW. U. L. REV. 199, 204–07 (2011) (explaining that causative probability concerns the analysis of likelihood within "individuated causal scenarios," as opposed to likelihood across an entire universe of cases, as mathematical probability would emphasize). It also overlaps in large measure with the concept of "truth-sensitivity," pioneered by Timothy Williamson and recently adapted by David Enoch and Talia Fisher. *See* TIMOTHY WILLIAMSON, KNOWLEDGE AND ITS LIMITS (2000); David Enoch & Talia Fisher, *Sense and Sensitivity: Epistemic and Instrumental Approaches to Statistical Evidence*, 67 STAN. L. REV. 557 (2015); *see also* Alex Stein, *The New Doctrinalism: Implications for Evidence Theory*, 163 U. PA. L. REV. 2085, 2092 n.35 (2015) [hereinafter Stein, *The New Doctrinalism*] (providing useful background on the concept). According to Professor Williamson, there is a difference between justifications that are accurate in particular cases for case-specific reasons and justifications that tend to be accurate across cases but only *happen to be* accurate in particular cases. In other words, a justification is "truth-sensitive" if it focuses on variables that tend, in context, to track truth, as opposed to variables that correlate to truth without tracking it. *See* Enoch & Fisher, *supra*, at 573–77. For excellent general background on these themes, see L. JONATHAN COHEN, THE PROBABLE AND THE PROVABLE (1977).

26. *See, e.g.*, Pardo & Allen, *supra* note 9, at 230 (enumerating these and other conditions of relative plausibility); Peter Thagard, *The Best Explanation: Criteria for Theory Choice*, 75 J. PHIL. 76 (1978) (famously offering "consilience"—the ability of an explanation to account for disparate facts—"simplicity, and analogy" as criteria that define the quality of explanations); *see also* Stein, *The New Doctrinalism*, *supra* note 25, at 2091 (listing "coherence, consilience, causality, and evidential support" as the variables that drive "relative plausibility" analysis).

inferences, it is worth entertaining.[27]

At a functional level, probability and plausibility often overlap. If Fact *X* rarely corresponds (in a probabilistic sense) with Explanation *A*, the explanation is unlikely to be worth entertaining. Likewise, the inverse: if Fact *X* often corresponds to Explanation *A*, the explanation will tend, in practice, to be superior to others.

But the two properties are analytically independent, and in two situations they pull apart. The first are cases that involve *unlikely but tailored explanations*. For example, suppose that Evan, an otherwise-healthy eighteen-year-old, starts experiencing heart palpitations—so he starts Googling and comes across a number of possible explanations, including Marfan's Syndrome, a rare tissue disorder. What catches his eye about Marfan's is that it corresponds to long, thin limbs, and Evan is considerably lankier than either of his parents.

In this example, the proposition that Evan has Marfan's is relatively plausible, in that it provides a holistic account of observed facts that do not readily admit of another explanation; many of us, for example, would think that Evan has good grounds to call the doctor.[28]

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27. *See, e.g.*, Pardo & Allen, *supra* note 9, at 229 nn.16–17 (compiling sources on the issue of what makes some explanations superior to others); *see also* David Schum, *Species of Abductive Reasoning in Fact Investigation in Law*, 22 CARDOZO L. REV. 1645, 1659–60 (2001) (exploring the epistemic mechanics of selecting among competing explanations, which, following Umberto Eco, he refers to as "undercoded abduction"); W. Bradley Wendel, *Explanation in Legal Scholarship: The Inferential Structure of Doctrinal Analysis*, 96 CORNELL L. REV. 1035, 1049–55 (2011) (arguing that inferences to the best explanation are inherently "contrastive" and enumerating criteria of comparison). As a conceptual matter, it is also possible to express the comparative aspect of plausibility analysis in statistical terms—in other words, to model the question of comparative likelihood quantitatively rather than qualitatively. Ed Cheng, for example, has developed a useful model of "comparative probability," designed to capture the upside of both the probabilistic view and the explanatory view simultaneously. According to Cheng, the comparison between competing explanations—the question of which explanation is "best"—can be expressed numerically by dividing the condition probability of one hypothesis, given known facts, by the probability of another hypothesis, given the same facts, and asking if the resulting fraction is greater than one (in which the hypothesis in the numerator is comparatively more likely), less than one (in which the hypothesis in the denominator is comparatively more likely), or one (in which case the two hypotheses are equally likely). *See* Cheng, *supra* note 24. I highly recommend Cheng's model. It seems like the most plausible—perhaps even the most probable!—numerical gloss on traditional explanatory standards.

28. Two caveats bear noting. First, one can certainly disagree with the idea that Marfan's is a relatively plausible explanation of observed facts; to some readers, for example, it might seem more plausible that Evan is a hypochondriac. Even so, relative plausibility, *not* predictive likelihood, would be the relevant terrain of dispute. Second, to say that Marfan's is relatively plausible now, given the limited information Evan knows, is to say nothing about whether, once more information surfaces, it will *remain* relatively plausible. The point is it clears that hurdle for the time being, despite its low probability overall.

But the proposition is still quite *improbable*.[29] Marfan's is rare.[30] Regardless of the fit between the observed facts and his provisional diagnosis, the likelihood that Evan actually has the disorder—if he had to make a wager on the proposition, say, with no further information—is small. But the inference still seems worth entertaining in context.

The second situation in which probability and plausibility diverge is the mirror-image of the first: cases that involve *likely but untailored predictions*. Untailored predictions come in two forms. For one thing, a prediction can be untailored because the interaction of input-variables is either opaque or too complex to trace, making it impossible to know what generated the prediction—so impossible, a fortiori, to know how the prediction relates to a given case. The Contraband Detector hypothetical is an example. Because officers cannot be sure which variables contribute to a "hit,"[31] they have no way of knowing, and thus no way of explaining to a judge, how the prediction maps on to any particular residence.

For another thing, a prediction can be untailored because its input-variables, though known, are too threadbare to permit meaningful evaluation of how well or poorly the prediction tracks a particular set of observed facts.[32] Imagine, for example, that a database tracking the relationship between electricity usage and drug manufacturing has uncovered that elevated usage patterns—say, ten times the average amount—has correlated eighty percent of the time, in the past, with drug manufacturing. Furthermore, suppose there is reason to think that drug manufacturers will be unable to avoid outsized electricity usage, so we have good grounds to believe the eighty

29. Suppose, for example, that one of Evan's friends responds by saying: "Wow—do you really think you have Marfan's?" If Evan is well-informed about the disease (and feeling level-headed), we would expect him to say something like: "I mean, no—probably not. It is a really rare disease. But I am worried, because I definitely have some of the symptoms." Indeed, if Evan were to respond more resolutely—"Yes, I am almost certain I have Marfan's! What am I going to do?"—he might be accused of sensationalism, or hypochondria. Given Evan's limited knowledge, there is simply no basis to conclude that he "almost certainly" has Marfan's, or even that he *likely* has Marfan's.

30. Daniel P. Judge & Harry C. Dietz, *Marfan's Syndrome*, 366 LANCET 1965, 1965 (2005) (noting that "[t]he incidence of classic Marfan's syndrome is about 2–3 per 10,000 individuals").

31. In practice, the potential reasons for this are numerous. Some are innocuous—such as lack of technical training on the officers' part—while others are more troubling. In many settings, for example, algorithms are untraceable because they are proprietary. *See generally* PASQUALE, *supra* note 13 (exploring the concept of "big data" and the hidden algorithms associated with it).

32. *See* Pardo & Allen, *supra* note 9, at 229–30 (explaining that relative plausibility analysis involves two distinct steps—first, "generating potential explanations of the evidence," and second, "choosing among potential explanations"). All three types of opacity raise concerns, in Enoch and Fisher's terms, about "truth-sensitivity." *See* Enoch & Fisher, *supra* note 25 (arguing for a redirection of the statistical evidence debate as to include the concept of sensitivity). The third type of opacity also raises concerns about what Luke Meier has described as epistemic "confidence." *See infra* note 42 and accompanying text.

percent figure is predictive moving forward. On these facts, would the observation that a given residence uses ten times the average amount of electricity be sufficient, by itself, to warrant a search? As in the Contraband Detector case, the answer is no, but the reason is slightly different. Here, the problem is not that the explanatory theory behind the prediction is unknown. On the contrary, the theory of wrongdoing—that drug manufacturing led to high electricity usage—is plain, and certainly plausible. The problem is that heightened electricity usage has many innocuous explanations.[33] From the fact of heightened usage alone, it is impossible to assess the relative plausibility of criminality in any given case by comparison to innocent explanations.[34]

Along these lines, consider an example of the Supreme Court's own fashioning: *Ybarra v. Illinois*.[35] Based on evidence that a local tavern owner was dealing heroin, the police secured a warrant to search the business. When they arrived at the tavern in the late afternoon, there were a small number of customers in the tavern (between nine and thirteen, the record was unclear), and the police proceeded to pat down all of them—including Ventura Ybarra, who was playing pinball. The pat-down yielded a cigarette pack, which, when opened by the searching officer, turned out to contain six tin foil packets of heroin.[36] Ybarra moved to suppress the heroin as fruit of an illegal search. He argued that his presence in the tavern, without more, failed to generate probable cause.

Although the state court upheld Ybarra's conviction—because the search had occurred "in a one-room bar where it [was] obvious from the complaint . . . that heroin was being sold or dispensed"[37]—the

33. Perhaps the occupant is a chef, who often practices her craft. Perhaps she is a computer enthusiast, operating a makeshift server out of her home. *See* JOSH FAIRFIELD, ESCAPE: PROPERTY, PRIVACY, AND THE INTERNET OF THINGS (forthcoming 2017) (book manuscript on file with author) (discussing an anecdote in which a friend of the author had his home raided, on suspicion of drug manufacturing, because he was running a makeshift server). Perhaps she is simply traveling for a few months and accidentally left her high-definition television on. Without more facts, it is impossible to meaningfully assess the relative plausibility of these (and other) innocent explanations by comparison to wrongdoing.

34. Naturally, it may well be a different situation if *no* other explanation came to mind—if the incriminating fact were, say, data about the purchase of a large stock of a particular chemical that has no (known) residential uses. That would make the inference more like an inference of wrongdoing from dog sniffs or radar guns: tools whose outputs typically admit of *no* plausible explanation (even putting the question of *relative* plausibility to one side) apart from wrongdoing.

35. 444 U.S. 85 (1979).

36. I am putting to one side the question of whether opening the cigarette carton qualified as a search. *See* Chadwick v. United States, 433 U.S. 1 (1977) (holding that a warrant was required before law enforcement could open a closed piece of luggage located during an otherwise lawful search of an impounded car). The *Ybarra* Court assumed for the sake of its analysis that opening the cigarette carton was not an independent Fourth Amendment problem. I will assume the same.

37. People v. Ybarra, 373 N.E.2d 1013, 1016 (Ill. App. Ct. 1978), *rev'd sub nom.* Ybarra v. Illinois, 444 U.S. 85 (1979).

Supreme Court reversed, denouncing the government's "guilt by association" theory of Fourth Amendment suspicion. As the Court put it:

> Upon entering the tavern, the police did not recognize Ybarra and had no reason to believe that he had committed, was committing, or was about to commit any offense under state or federal law. Ybarra made no gestures indicative of criminal conduct, made no movements that might suggest an attempt to conceal contraband, and said nothing of a suspicious nature to the police officers. In short, the agents knew nothing in particular about Ybarra, except that he was present, along with several other customers, in a public tavern at a time when the police had reason to believe that the bartender would have heroin for sale.[38]

According to the Court, this was not enough to justify the search of Ybarra; someone's "mere propinquity to others independently suspected of criminal activity does not, without more, give rise to probable cause to search that person."[39] Rather, "probable cause [must be] particularized . . . to [each] person," a standard that can never be satisfied by "pointing to the fact that coincidentally there exists probable cause to search . . . another or to search the premises where the person may happen to be."[40]

There are two ways to read *Ybarra*.[41] First, the Court may have been concerned about whether the officers' inference of wrongdoing was accurate. It may have been skeptical that someone's presence in the tavern at that particular time of day actually predicted criminal activity, regardless of the officers' hunches to that effect. Second, the Court may have thought the inference troubling regardless of accuracy. It may have found the associational claim of wrongdoing insufficient because of the type of inference on which it rested, no matter its predictive power.

I find the latter reading more convincing. It seems implausible that *Ybarra* would have come out differently if, holding everything else equal, the police had been able to point to evidence—a study, say, or

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38. *Ybarra*, 444 U.S. at 90–91.

39. *Id.* at 91.

40. *Id.*; *see also* Sibron v. New York, 392 U.S. 40, 62 (1968) (holding that police had no probable cause to arrest a man they "merely saw . . . talking to a number of known narcotics addicts over a period of eight hours," because the police were "completely ignorant regarding the content of [the] conversations," and "[t]he inference that persons who talk to narcotics addicts are engaged in the criminal traffic in narcotics is simply not the sort of reasonable inference required to support an intrusion by the police upon an individual's personal security"); United States v. Di Re, 332 U.S. 581, 583–87 (1948) (holding it unlawful for officers to search all three passengers of car that was suspected of carrying contraband, when an informant's tip had only designated the driver—not the passengers—as likely to be involved in wrongdoing); *cf.* Florida v. J.L., 529 U.S. 266, 274 (2000) (holding that law enforcement may not stop and frisk a suspect based solely on an anonymous tip describing the suspect's clothing and whereabouts).

41. This ambiguity is not necessarily a drawback. It may be that the Court was skeptical on *both* fronts—leading it to analyze the question holistically.

historical arrest records—establishing that people who pass their weekday afternoons in this specific tavern are fifty-one percent likely to be connected to drug activity. The reason is simple: evidence of a statistical link between being in this particular tavern and criminal activity would have made it more probable that each frisk would yield evidence of wrongdoing, but it would not have made that result more plausible. The latter question depends on the evaluation of other explanations for a person's presence in the tavern. And this, in turn, depends on access to information that gives rise to other explanations for one's presence in the tavern,[42] which is precisely what the officers in *Ybarra* lacked.[43] In other words, the theory of wrongdoing in *Ybarra*, though perfectly comprehensible, was untailored—so even if, in a statistical sense, the theory was likely, it failed to carry the burden of relative plausibility.

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42. In epistemic terms, this property can be described as "confidence"—that is, the confidence that an observer has in the veracity of her impression of likelihood, as distinct from the impression of likelihood itself. Suppose the Yankees are playing the Cardinals in the World Series, and all Mary knows is that the Yankees are favored (according to reliable experts) nine to one. From this, Mary would have grounds to conclude that the Yankees are ninety percent likely to win the World Series. But Mary nonetheless may be circumspect about drawing this conclusion, because she does not have *enough* information to confidently pronounce on the matter at hand. In this sense, Luke Meier refers to "confidence" as "the sufficiency of information from which to make a probability analysis." Luke Meier, *Probability, Confidence, and the "Reasonable Jury" Standard*, 84 MISS. L.J. 747, 789 (2015); *see also* ALEX STEIN, FOUNDATIONS OF EVIDENCE LAW 48 (2005) (describing the same property as "resiliency"); Marjorie Anne McDiarmid, *Lawyer Decision Making: The Problem of Prediction*, 1992 WIS. L. REV. 1847, 1878–80 (diagnosing lack of confidence/resilience as the issue highlighted in L. Jonathan Cohen's famous "gatecrasher" hypothetical). Although Professor Meier styles his analysis exclusively in terms of probability, the same reasoning comfortably applies to plausibility as well. The point is that *all* claims of likelihood, whether probabilistic or "plausibilistic" in nature, embed a second-order confidence level (as distinct from the first-order assertion of likelihood) based on the amount and quality of evidence that contributed to the assertion—and, more important, the amount and quality of evidence left out. Though esoteric-sounding, the idea is familiar enough to everyday life. Imagine Joe has three friends visiting for the weekend, and he wants to take them to his favorite restaurant, Rose's. Sadly for Joe, no reservations are available in the main dining room; the only option is the bar, which is first-come, first-served. When Joe calls Rose's to ask about the situation at the bar, the host informs him that it is "usually hard to find seats for more than two." Does the host's observation—assuming it is reliable—make the proposition that Joe's party of four will get seats at Rose's relatively implausible? On its own, no—we need more information to evaluate the proposition's relative strength. Is Joe planning to visit Rose's on a weekend night or a weekday night? (And which one was the host describing?) Is there reason to think that crowds might be thinner on the particular night that Joe has in mind? And so on. Of course, these are exactly the questions that we would expect Joe to ask himself. Relative plausibility analysis—shaped by implicit "confidence" conditions—is very natural to adult humans.

43. *See Ybarra*, 444 U.S. at 93–94 (noting that the officers "neither recognized [Ybarra] as a person with a criminal history nor had any particular reason to believe that he might be inclined to assault them"); *see also* Pardo & Allen, *supra* note 9, at 229 (explaining that plausibilistic reasoning "occurs in two steps: generating potential explanations of the evidence and then selecting the best explanation from the list of potential ones as an actual explanation or as the truth").

Ultimately, whether a prediction is untailored because it rests on a threadbare explanation, as in *Ybarra* and the electricity usage example, or because it lacks explanatory power outright, as in the Contraband Detector hypothetical, the upshot is the same. It is possible for an inference to be likely, in a probabilistic sense, without being relatively plausible. The latter depends not only on the predictive power of an inference, but also on its "quality."[44] Specifically, it depends on whether the factual inputs giving rise to the inference enable an observer to meaningfully compare different explanations before deciding which to entertain. This, in turn, depends on the factual inputs being (1) known, (2) traceable, and (3) rich enough to *generate* multiple explanations. If any of these conditions is lacking, no analysis of relative plausibility can be performed.

II. OUR JURISPRUDENCE OF "PLAUSIBLE CAUSE"

Having explored the formal contours of the probability-plausibility distinction, we are now in a position to ask which model better describes existing law. Although the Supreme Court, following the text of the Constitution, has always used the term "probable cause," its reasoning tracks the plausibility model of suspicion. For the last half century, the Court has called for totality-of-the-circumstances analysis that focuses on whether law enforcement's theory of wrongdoing explains observed facts.[45] Especially since 1983, when *Illinois v. Gates* universalized this approach,[46] the Court has continually emphasized that suspicion is a "fluid" concept,[47] "not readily, or even usefully, reduced to a neat set of legal rules."[48] Because suspicion reflects the "practical considerations of everyday life on which reasonable [people],

44. *See* Pardo, *supra* note 9, at 604 ("Under standards of proof higher than a preponderance of the evidence, the quality of an explanation needed to satisfy the standard rises accordingly."). For certain theorists, including Professor Pardo, focus on the "quality" of adduced evidence is a distinct—but epistemologically equivalent—way of saying that law enforcement bears the burden of proof in this context.

45. *See, e.g.*, Navarette v. California, 134 S. Ct. 1683, 1687 (2014).

46. *See* Illinois v. Gates, 462 U.S. 213, 230–31 (1983) (explaining, in the context of an informant's tip, that the "totality-of-the-circumstances approach is far more consistent with our prior treatment of probable cause" than any rigid test of reliability—and overturning precedent on that basis). This framework also applies to claims of reasonable suspicion.

47. *Id.* at 232.

48. *Id.*; *see also* Florida v. Harris, 133 S. Ct. 1050, 1055 (2013) (explaining that when it comes to assessing probable cause, "[the Court] ha[s] rejected rigid rules, bright-line tests, and mechanistic inquiries in favor of a more flexible, all-things-considered approach").

not legal technicians, act,"[49] it resists "precise definition or quantification."[50]

On their own, these formulations are hardly remarkable. The law is replete with fact-bound tests that defy "reduc[tion] to a neat set of . . . rules." What *is* remarkable, however, is how reluctant the Court has been to assign numerical values to suspicion benchmarks, or to pick out specific variables for greater weight in the totality-of-the-circumstances analysis. Of course, this reticence may be pragmatic.[51] It is conceivable, for instance, that the Justices worry about numerical benchmarks—even if accurate—clouding suspicion decisions on the ground.[52] The plausibility view, by contrast, provides a *principled* explanation for the Court's reticence. Plausibility is qualitative, not quantitative. So it only stands to reason that the Court's analysis would shy away from numbers, in favor of narrative explanations.[53]

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49. Brinegar v. United States, 338 U.S. 160, 175 (1949).

50. Maryland v. Pringle, 540 U.S. 366, 371 (2003).

51. Various scholars have argued that judges worry about getting numerical benchmarks wrong. *See, e.g.*, Lerner, *supra* note 10, at 995 ("Few courts have summoned the courage, or foolhardiness, to propose [a specific number] for probable cause."). Judges could also be concerned that benchmarks—even assuming they are properly calibrated—will tend to inflame cognitive biases that distort suspicion determinations. *See* Bambauer, *supra* note 3, at 482 & nn. 108–113 (outlining biases). Finally, the absence of numbers may reflect an unstated intuition that suspicion benchmarks, though numerical, are also *unstable*—shifting, for example, in response to how intrusive particular investigative tactics are, or the gravity of the crime under investigation. *See* Bacigal, *supra* note 7, at 338–39 (arguing that benchmarks of probable cause, though articulable numerically, essentially *are* imprecise—so any specified numbers would be, by definition, misleading). If so, then numerical benchmarks would become, so to speak, moving targets. And wariness about explicating them would make sense. *See* SLOBOGIN, *supra* note 8, at 37–46 (advocating a "proportionality" approach to probable cause that would impose more or less exacting requirements, based on context, risk factors, and the like). *See generally* Kerr, *supra* note 3, at 132 (hypothesizing that perhaps the Justices are simply "afraid of math").

52. *See, e.g.*, Goldberg, *supra* note 10, at 827 (arguing that the "benefits and drawbacks" of "quantifying probable cause" depend "on the types of evidence used to satisfy probable cause"—in some settings, on Goldberg's view, quantification stands to improve the status quo, in other settings, no); *see also* Colb, *supra* note 7 (exploring the difficulties that humans often encounter when trying to relate statistical evidence to particular cases); David L. Faigman, John Monahan & Chris Slobogin, *Group to Individual (G2i) Inference in Scientific Expert Testimony*, 81 U. CHI. L. REV. 417, 421–27 (2014) (same).

53. Putting the dearth of numbers to one side, the plausibility view also explains why the Court has not picked out specific variables for (presumptively) heightened weight in the suspicion analysis. If suspicion depended on probability, it would surely be possible to designate certain variables as "highly probative," on heuristic grounds at least. But if suspicion depends on narrative explanation, such designations would make little sense, because the connection between a given variable and the set of possible explanations would depend entirely on context. Predictions offered ex post, in the context of a suppression hearing or a 1983 challenge, would only be liable to distort the inquiry.

A. Explanations, Not Predictions

Beyond the formal consonance between "plausible cause" and the totality-of-the-circumstances approach to suspicion, the Court's reasoning in individual cases also underscores its preference for explanatory, as opposed to predictive, reasoning. In *Ybarra v. Illinois*, discussed above,[54] the Court held that someone's mere presence in a tavern whose owner was suspected of drug trafficking did not establish probable cause to perform a search. In so holding, it emphasized that "[e]*ach patron* who walked into [the tavern] was clothed with constitutional protection against an unreasonable search or an unreasonable seizure."[55] Thus, the officers needed a reason to favor the inference of wrongdoing "with respect to [each patron],"[56] not a blanket reason, like mere presence in the tavern, that applied indiscriminately to *every* patron. In other words, the reason for intrusion needed to be one that provided the officers—and could have provided a judge—with grounds to believe that wrongdoing was more plausible in the case of each patron than the best innocent explanation. On this front, *Ybarra* was an easy case; the best innocent explanation was obvious. Each patron might have been in the tavern simply to patronize the tavern. So plausible cause did not exist.[57]

Similar reasoning was discernible in *Florida v. J.L.*,[58] a case about the sufficiency of an anonymous tip to establish reasonable suspicion for a *Terry* stop. A tipster called 911 to report that "a young black male standing at a particular bus stop and wearing a plaid shirt was carrying a gun."[59] Officers were dispatched, and, upon arrival, they saw three people, one of whom—the respondent, J.L.—was donning a plaid shirt. The officers proceeded to frisk J.L., despite the fact that "[a]part from the tip, [they] had no reason to suspect any of the [occupants] of illegal conduct."[60] Not only did "officers . . . not see a firearm" after approaching J.L.; the state conceded that he "made no threatening or . . . unusual movements."[61] The frisk recovered a gun, which eventually became the basis of a criminal conviction.

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54. *See supra* notes 35–43 and accompanying text.

55. Ybarra v. Illinois, 444 U.S. 85, 91 (1979) (emphasis added).

56. *Id.*

57. For similar examples, see *Sibron v. New York*, 392 U.S. 40, 62 (1968) (noting no cause to arrest someone merely because he frequented an establishment known to be a hangout for drug users); and *United States v. Di Re*, 332 U.S. 581, 583–87 (1948) (noting no cause to search the passengers of a car solely because the driver was suspected of carrying contraband).

58. 529 U.S. 266 (2000).

59. *Id.* at 268.

60. *Id.*

61. *Id.*

J.L. challenged the frisk, and the Court held it unlawful. The Court was particularly concerned about the threadbare nature of the case against J.L. "Unlike a tip from a known informant whose reputation can be assessed and who can be held responsible if her allegations turn out to be fabricated," Justice Ginsburg wrote, "an anonymous tip alone seldom demonstrates the informant's basis of knowledge or veracity."[62] For an anonymous tip to justify a *Terry* stop, it must be tested by follow-up "police observation."[63]

Like *Ybarra*, *J.L.* is susceptible to two readings. Is the problem that anonymous tips tend to be inaccurate? Or is the problem that *regardless* of their accuracy—no matter how well or poorly anonymous tips predict wrongdoing across cases—the police may not infer criminal activity from evidence that, in any particular case, is as likely to be unreliable as it is to be reliable? Once again, I favor the latter reading. It is hard to imagine that *J.L.* would have come out differently if, for example, the police had pointed to data showing that anonymous tips are truthful and accurate (in this specific jurisdiction) sixty percent of the time. Even if accurate, this additional data would not have neutralized Justice Ginsburg's concern. Statistics aside, the police still had no reason to credit the anonymous tip *in this case*. Without the benefit of other "indicia of reliability,"[64] there was simply no basis to disfavor the best innocent explanation of events—that the tipster had lied. So wrongdoing was not relatively plausible.[65]

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Concerns about the plausibility are also discernible in cases where the Court has blessed intrusions rather than rebuking them. Take *United States v. Sokolow*.[66] There, DEA agents stopped Andrew Sokolow after he landed in Honolulu en route from a short trip to Miami; a search of Sokolow's luggage eventually yielded a large quantity of cocaine. Sokolow moved to suppress the drugs on the grounds that the agents lacked reasonable suspicion to perform the

62. *Id.* at 270 (quoting Alabama v. White, 496 U.S. 325, 329 (1990)).

63. *Id.*; *see also White*, 496 U.S. at 328–29 (holding that police had reasonable suspicion to perform a *Terry* stop on the basis of an anonymous tip, but only after corroborating details of the tipster's story—thereby enhancing the tip's reliability).

64. *J.L.*, 529 U.S. at 270.

65. Indeed, even when the Court has embraced relatively "thin" claims of reasonable suspicion, it has explicitly refused to adopt bright-line rules or formulae urged by the government. *See, e.g.*, Illinois v. Wardlow, 528 U.S. 119 (2000) (holding, on the facts of the case, that the police had reasonable suspicion to stop an unknown person who fled in response to their arrival at a building, but declining to adopt the government's theory that flight equals suspicion).

66. 490 U.S. 1 (1989).

search. When the DEA agents initially detained Sokolow, they knew five things: (1) he had travelled from Honolulu to Miami and back—for a total of more than twenty hours in the air—for a visit of approximately forty-eight hours; (2) he checked no luggage; (3) he paid for his plane ticket in cash, using a wad of twenty-dollar bills; (4) the home phone number Sokolow gave the airline appeared not to be genuine, leading the agents to believe that he was traveling under an alias; and (5) he exhibited "nervous behavior" during his trip.[67]

Did these five facts, taken in tandem, give the DEA agents reasonable suspicion to detain Sokolow and search his bags? The Court said yes. But it went to great length to emphasize that its holding was irreducibly contextual—a reflection of the "whole picture"[68]—and that no particular piece of evidence was the animating factor of its analysis. For instance, the Court acknowledged that "traveling under an alias [does not necessarily] reflect ongoing criminal activity: for example, a person who wished to travel to a hospital or clinic for an operation [might] wish[ ] to conceal that fact."[69] Similarly, nervous behavior while flying, the Court opined, is hardly evidence of criminality; one might simply "be seeking to avoid a confrontation with an angry acquaintance or with a creditor."[70] Indeed, even the more eyebrow-raising factors—such as the short trip to Miami, or the use of wadded-up cash to purchase the tickets, both of which the Court found "out of the ordinary"—were "not by [themselves] proof of any illegal conduct."[71]

In other words, every individual piece of evidence was "quite consistent with innocent travel."[72] The problem was their combination. Although it was certainly possible to imagine innocent explanations behind Sokolow's trip, none seemed relatively plausible. Maybe under different background conditions—if, for example, it had been Super

67. *Id.* at 3.

68. *Id.* at 8 (citing United States v. Cortez, 449 U.S. 411, 417 (1981)).

69. *Id.*

70. *Id.* One wonders—in passing—how many people in the history of commercial air travel have encountered an angry creditor while strolling through the airport.

71. *Id.* at 8–9. Interestingly, Justice Scalia—at oral argument—begged to differ. He seemed to find the notion of purchasing airline tickets with twenty dollar bills *ipso facto* suspicious. *See* Transcript of Oral Argument at 8, United States v. Sokolow, 490 U.S. 1 (No. 87-1295):

> [GOVERNMENT LAWYER]: [A] lot of people use cash to purchase a ticket on a shuttle going from New York to Washington, so we're not saying that the simple fact that someone has paid for a ticket in cash is necessarily indicative of criminal conduct. But this was a $2,100 purchase . . . [in] $20 bills.
>
> [JUSTICE SCALIA]: Are you sure that that alone wouldn't be enough? I mean that's rather extraordinarily [sic], isn't it, just handing over to somebody [multiple thousands of dollars] of $20 bills?

72. *Sokolow*, 490 U.S. at 9.

Bowl weekend in Miami during Sokolow's visit[73]—the innocent explanation might have prevailed: the inference of wrongdoing might have been relatively implausible in light of an "apparent explanation" to the contrary.[74] But under the facts presented, not so; it was plausible, the Court thought, to infer that Sokolow was trafficking drugs.[75]

Not everyone agreed. In dissent, Justice Marshall maintained that "[t]he . . . circumstantial facts known about Sokolow . . . [were] scarcely indicative of criminal activity,"[76] a point he made by cycling through those facts one by one:

> [T]hat Sokolow took a brief trip to a resort city for which he brought only carry-on luggage . . . describes a very large category of presumably innocent travelers. That Sokolow embarked from Miami, "a source city for illicit drugs," is no more suggestive of illegality; thousands of innocent persons travel from "source cities" every day and, judging from the DEA's testimony in past cases, nearly every major city in the country may be characterized as a source or distribution city. That Sokolow had his phone listed in another person's name also does not support the majority's assertion that the DEA agents reasonably believed Sokolow was using an alias; it is commonplace to have one's phone registered in the name of a roommate, which, it later turned out, was precisely what Sokolow had done. . . . Finally, that Sokolow paid for his tickets in cash indicates no imminent or ongoing criminal activity. The majority "feel[s] confident" that "[m]ost business travelers . . . purchase airline tickets by credit card or check." Why the majority confines its focus only to "business travelers" I do not know, but I would not so lightly infer ongoing crime from the use of legal tender.[77]

Individually, each of these points is forceful and well taken. At some level, however, Justice Marshall's approach to the question is unresponsive to the majority's "plausibilistic" reasoning. The point is not that any specific piece of evidence was especially probative of criminal activity, or even that *all* the evidence, taken in tandem, was especially probative of criminal activity. To make the latter claim, the majority would have had to analyze the overall likelihood of wrongdoing, which, apart from being difficult, is simply not what its opinion focused on. Instead, the opinion was focused on a slightly different question, one that arguments like Justice Marshall's, even if sound, would be unlikely to undercut: whether "drug trafficking" was a

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73. *See* Transcript of Oral Argument, *supra* note 71, at 7:

> [JUSTICE STEVENS]: May I ask . . . [what] if on Super Bowl weekend someone flew from Honolulu to Miami and back, and they, they had a pretty obvious explanation for a three-day trip[?]
>
> [GOVERNMENT LAWYER]: Yes, if, if there was . . . [But] there was in this case no sort of obvious, apparent explanation.

74. *Id.*

75. *Id.*; *see also* United States v. Arvizu, 534 U.S. 266 (2002) (holding that border patrol officer had reasonable suspicion to perform a traffic stop—and rebuking the Ninth Circuit for writing off certain facts as "irrelevant" to the totality of circumstances analysis).

76. *Sokolow*, 490 U.S. at 15 (Marshall, J., dissenting).

77. *Id.* at 15–16 (internal citations, quotation marks, and alterations omitted).

plausible narrative to entertain, given the limited universe of known facts. And the answer, according to the majority, was yes.[78]

In a similar vein, consider *Pringle v. Maryland*.[79] At 3:00 a.m. on a Saturday night, law enforcement pulled over a car with three occupants: a driver, a front-seat passenger, and a back-seat passenger. The driver consented to a search of the car, which yielded a small bag of crack, divided up into individual baggies, and approximately $700 in small bills. When the officers asked whom the drugs belonged to, all occupants demurred. So the officers arrested all three. Eventually, the front-seat passenger, Joseph Pringle, was charged with possession with intent to distribute. Challenging the initial arrest, Pringle argued that the officers had no grounds to arrest anyone in the car, because, without more information, it was thirty-three percent likely that the drugs belonged to any given occupant—not enough for probable cause.[80]

The Court rejected Pringle's argument, holding that it was reasonable for the officers to hypothesize that all three suspects were drug dealers, engaged in a common enterprise.[81] As in *Sokolow*, however, the Court gave no indication that any one detail, or constellation of details, had tipped the scales. On the contrary, it made clear that its conclusion was based on a holistic review of the facts.[82] Also as in *Sokolow*, the strategy on the other side—as articulated by Pringle's lawyer, since there was no dissenting opinion—was to explain away each individual fact as plausibly the result of innocent behavior. For example, when asked by an incredulous Justice Souter if *she* typically carried around hundreds of dollars in small bills, the lawyer

78. To be clear, I am not trying to suggest that *Sokolow* is an obvious or uncontroversial case. It may be that the majority was *wrong* about the relative plausibility of drug trafficking, by contrast to innocent explanations of the observed facts. The point is simply that *that* question—what is a relatively plausible explanation of the observed facts, as they fit together?—is precisely what, under a plausible cause standard, we would expect judges and litigants to debate. In fact, this is undoubtedly why Sokolow's lawyer focused, during argument, on generating countervailing explanations of *all* observed facts—for example, that Sokolow was on a gambling trip, or that he didn't own a credit card and was attending a funeral. *See* Transcript of Oral Argument, *supra* note 71, at 10.

79. 540 U.S. 366 (2003).

80. For further background, see *id.* at 367–69. Pringle also argued that if the Court felt compelled to come up with a bright-line rule, it should make the default that *drivers*, but not passengers, may be arrested under circumstances of ambiguous possession—in light of the greater degree of control that drivers presumptively exercise over the car.

81. By so resolving the case, the Court was able to skate by the considerably more difficult question of how to analyze a truly one-third, one-third, one-third situation. *See* Colb, *supra* note 7, at 75 (exploring the latter).

82. *See, e.g.*, *Pringle*, 540 U.S. at 372 n.2 (noting—contra the lower court—that the presence of money in the car should not be "consider[ed] . . . in isolation," but rather, as a "factor in the totality of circumstances [analysis]").

replied that yes, she did, and so do many other law-abiding citizens.[83] Likewise, when asked about the late hour, Pringle's lawyer suggested that people in their early twenties are often out late on weekend nights—nothing strange about that.[84] After a few minutes of similar back-and-forth, Justice Breyer interrupted her, in an illuminating burst of frustration:

> I just think that—look, it just doesn't strike me as *plausible* that when you have three people in a car, one of them would stuff some drugs behind an armrest where they're very easy to find, unless he thought the other two were in on it, I mean, unless you thought the other two at least didn't care, and if they didn't care they're out there transporting the drugs with them. . . . So [Pause.] . . . I don't even know, I mean, what I'm struggling for is, that seems like a reasonable inference so how—how do I know, I mean, *I'm* making this kind of inference. How do I know [if] I should or not?[85]

Just as in *Sokolow*, the trouble with Pringle's point-by-point rejoinder was that the Court was not focused on the probative value of particular facts. It was focused on developing an explanatory account of *all* the facts.[86] On that front, the Court's impression was clear: it seemed plausible, in context, that all three men were involved in a joint criminal enterprise.[87] Whether the Court was *right* to find that explanation plausible can, of course, be debated. But the question would be how convincing the explanation was in light of all observed facts, not whether any one fact was especially incriminating.

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83. *See* Transcript of Oral Argument at 31, Maryland v. Pringle, 540 U.S. 366 (2003) (No. 02-809) ("[JUSTICE SOUTER]: Do you have a roll of bills exposed in your glove compartment? [DEFENSE COUNSEL]: At times I do, Your Honor. [JUSTICE SOUTER]: You do? [DEFENSE COUNSEL]: Yes."). In addition to underscoring the "plausibilistic" nature of the question presented, Justice Souter's incredulity also teed up a joke. After defense counsel's second affirmation that she "at times" carries wads of small bills in her glove compartment, Justice Souter replied—to laughter from the audience—"*You better be careful if you do.*" *Id.* (emphasis added).

84. *See id.* at 27:

> [DEFENSE COUNSEL]: This is . . . 3:16 AM. It is in a residential area. This was not in fact a high crime area. And I think under the totality of circumstances we have to put that in context . . . . [I]t's 3:00 [AM] on a Saturday night with a car of three young men in their twenties in a residential area, and I think anyone who has children of that age knows that often their Saturday night does not even begin until 10:00 or 11:00 [PM].

85. *Id.* at 43–44 (emphasis added).

86. Indeed, the Court explicitly rebuked the Maryland Court of Appeals for concluding that "money, without more, is innocuous." *Pringle*, 540 U.S. at 372 n.2 (quoting Pringle v. State, 805 A.2d 1016, 1028 (2002)). The Court explained that "the [state] court's consideration of the money in isolation, rather than as a factor in the totality of the circumstances, is mistaken in light of our precedents." *Id.*

87. *Id.* at 373:

> [W]e think it was reasonable for the officer to infer a common enterprise among the three men. The quantity of drugs and cash in the car indicated the likelihood of drug dealing, an enterprise to which a dealer would be unlikely to admit an innocent person with the potential to furnish evidence against him.

B. Tool-Assisted Detection

The relative plausibility framework also casts light on the Court's approach to detection tools, like radar guns and canine units. A "hit" from a detection tool is ambiguous between two inferences: (1) wrongdoing (a true-positive) and (2) a malfunctioning tool (a false-positive). The goal of relative plausibility analysis is to assess the comparative strength of the first inference over the second. In short, does the officer have grounds, all things considered, to infer that the tool (whether animal or mineral) is reliable in general, and that it performed correctly in context?

Take an everyday example: a highway patrol officer points a radar gun at a car, measuring a speed in excess of the relevant limit. Does the officer have grounds, based on the radar gun's output, to perform a traffic stop (and, at her discretion, to issue a ticket)? In general, the answer must be yes. Radar is a mainstay of speeding enforcement. A theory of suspicion that failed to approve the use of radar guns would be in serious trouble, I think, on *reductio ad absurdum* grounds.

At the same time, however, the answer cannot be categorically yes. Radar guns malfunction. Humans make mistakes. And if the facts and circumstances, construed in their totality, indicate that a false-positive may have occurred, an officer will *not* have cause to search based on the gun's output, notwithstanding its reliability across cases. The question, in other words, remains entirely context-bound. It happens to be that in the lion's share of cases, contextual clues will likely tilt in favor of inferring wrongdoing—because radar guns usually work. To say this, however, is emphatically *not* to say that a radar gun's output is sufficient grounds to justify a traffic stop. On the contrary, a radar gun's output is *never* sufficient to justify a stop; it always needs to be supplemented with an appreciation (and analysis) of surrounding facts.

Another example—more prominent in the Court's case law—are detection dogs. In *Florida v. Harris*,[88] the Court blessed canine alerts as an important, though not conclusive, factor in suspicion decisions. The petitioner in *Harris* argued, echoing the Florida Supreme Court's opinion below,[89] that before a canine alert can justify a follow-up search, officers must march through a "checklist" of variables, designed to test

88. 133 S. Ct. 1050, 1056–57 (2013).

89. *See* Harris v. State, 71 So.3d 756, 771–72 (Fla. 2011) ("[W]e . . . hold that the State . . . must present all records and evidence that are necessary to allow the trial court to evaluate the reliability of the dog.").

the dog's reliability.[90] Justice Kagan, writing for the Court, disagreed. In her words, a checklist

> is the antithesis of a totality-of-the-circumstances analysis. It is, indeed, the very thing we criticized . . . when we overhauled our method for assessing the trustworthiness of an informant's tip. A gap as to any one matter . . . should not sink the State's case; rather, that deficiency may be compensated for, in determining the overall reliability of a tip, by a strong showing as to other indicia of reliability. So too here, a finding of a [drug] dog's reliability cannot depend on the . . . satisfaction of multiple, independent evidentiary requirements. No more for dogs than for human informants is such an inflexible checklist the way to prove reliability, and thus establish probable cause.[91]

Scholars have little affection for *Harris*. To many, the case seems to afford law enforcement blanket authority to turn canine alerts—already an under-regulated practice[92]—into intrusive searches in virtually all cases.[93]

At a practical level, these misgivings are understandable. But it is important to be clear about what, exactly, the case holds. The *Harris* Court is not saying that canine alerts always generate probable cause. Indeed, just the opposite—the Court is insisting that whether a specific canine alert supports an inference of wrongdoing is an irreducibly case-specific question.[94] There are many contexts in which a canine alert plausibly indicates wrongdoing. But the word "many" is important. Exceptions matter. And the way to identify exceptions, *Harris* makes clear, is by examining contextual clues, not consulting formal criteria. In other words, as Justice Kagan put it, exceptions to a dog's general reliability are identified the same way that "inquiry into probable cause" always proceeds: by asking "whether all the facts surrounding a

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90. 133 S. Ct. at 1056.

91. *Id.* (citations, internal quotation marks, and alterations omitted).

92. *See, e.g.*, Illinois v. Caballes, 543 U.S. 405, 411 (2005) (Souter, J., dissenting):

> At the heart . . . of . . . the Court's opinion today is the proposition that sniffs by a trained dog are *sui generis* because a reaction by the dog in going alert is a response to nothing but the presence of contraband. . . . Hence, the argument goes, because the sniff can only reveal the presence of items devoid of any legal use, the sniff "does not implicate legitimate privacy interests" and is not to be treated as a search.

(citations omitted).

93. *See, e.g.*, Kit Kinports, *The Dog Days of Fourth Amendment Jurisprudence*, 108 NW. U. L. REV. COLLOQUY 64, 65–66 (2013) (suggesting that *Harris* effectively establishes a bright-line rule in favor of law enforcement); Rich, *supra* note 6, at 915–18 (compiling sources); *see also* Goldberg, *supra* note 10, at 816–19 (exploring the mathematical difficulties of using dog alerts as the primary input for suspicion); Richard E. Myers II, *Detector Dogs and Probable Cause*, 14 GEO. MASON L. REV. 1, 12–18 (2006) (showing, via Bayes' Theorem, that inferring wrongdoing from a positive dog alert is often statistically unsound).

94. That being said, commentators have not been wrong to fault *Harris* for offering scant guidance—both for law enforcement officers on the ground and for lower courts charged with reviewing their decisions—about what should *drive* contextual analysis. *See, e.g.*, Rich, *supra* note 6, at 915–18 (compiling sources). On that front, the criticism of *Harris* is well taken. But it should not be confused for a grievance with the Court's analytic framework.

dog's alert . . . would make a reasonably prudent person think that a search would reveal contraband or evidence of a crime."[95]

Lower court jurisprudence reinforces the point. Equipped with the contextual standard from *Harris*, appellate and trial courts have proceeded exactly as one might expect: endorsing police reliance on canine alerts in most cases—but not *all* cases. Typically, lower court opinions proceed in two steps. First, they establish a baseline of reliability by assessing the specific dog's performance under controlled conditions.[96] Second, they turn from the dog's aptitude in general to the question of what the officer, in the particular case, observed—and whether it was plausible, based on those observations, to infer wrongdoing. In most cases, the answer is yes; if the dog is reliable, an alert usually justifies a search. But in some cases—for example, when it is ambiguous whether contraband truly occasioned the alert,[97] or when background conditions may have compromised the dog's performance[98]—the answer is no. Either way, the courts have been

95. 133 S. Ct. at 1058. Along these lines, another aspect of Fourth Amendment law that the relative plausibility framework helps explain is the particularity requirement of warrants *themselves*—or, really, of all searches and seizures carried out pursuant to probable cause. If a dog alerts near Suspect *X* at an airport, the dog's handlers have some idea of where to search. If the dog alerted on his body, they might perform a cavity search; if the dog alerted on a particular piece of luggage, they might search that; and so on. Contrast this with a case in which no specific alert occurs—rather, law enforcement uses a Contraband Detector (or the like) to pick out specific people for searches. When the tool "alerts," where should law enforcement search? The person's body? All his luggage? His home? In other words, the dog alert—much like informant testimony—conveys to law enforcement a specific narrative of wrongdoing, albeit a crude one. The same is not necessarily true of a suspicion algorithm. *See, e.g.*, Groh v. Ramirez, 540 U.S. 551, 557 (2004) (holding a search warrant for a residence invalid because it failed to "provide[ ] [any] description of the type of evidence sought," thereby depriving the owner of any opportunity to "inspect[ ]" and enforce the warrant's terms).

96. *See, e.g.*, United States v. Trejo, 551 F. App'x 565, 568–71 (11th Cir. 2014) (holding a dog alert reliable due to evidence of training and field performance); United States v. Green 740 F.3d 275, 282–84 (4th Cir. 2014) (same); *see also* United States v. Bentley, 795 F.3d 630, 635–37 (7th Cir. 2015) (voicing concern about the drug dog's high false-positive rate, but deferring to the district court's determination—largely in light of training evidence—that under TOC, the alert was reliable); United States v. Thomas, 726 F.3d 1086, 1096–97 (9th Cir. 2013) (holding it non-harmless error when the trial court failed to require law enforcement to turn over a dog's performance records, because it deprived defendant of an opportunity to make meaningful arguments about the reliability of the specific alert).

97. *See, e.g.*, United States v. Funds in the Amount of One Hundred Thousand One Hundred & Twenty Dollars ($100,120.00), 730 F.3d 711, 719–24 (7th Cir. 2013) (reversing trial court's grant of summary judgment for the government, on the grounds that a question of fact existed as to whether a dog's alert was in response to currency tainted with drugs—which would establish probable cause—or, rather, in response to the presence of currency, period—which would not); *see also* United States v. Simeon, 115 F. Supp. 3d 981, 1001–02 (N.D. Iowa 2015) (discussing the importance of analyzing, in each particular case, whether "cueing" occurred before deeming the alert reliable).

98. *See, e.g.*, United States v. Heald, 165 F. Supp. 3d 765, 777–81 (W.D. Ark. 2016) (holding that a dog's alert was unreliable, in context, notwithstanding solid training and credentials, mostly due to the sweltering heat and the novelty of the circumstance).

quite clear: consistent with *Harris*, the dispositive question is not the dog's background reliability. It is what a reasonable officer, having witnessed a particular alert in context, would understand it to signify.

* * *

Before moving on to normative analysis, it bears noting that prediction tools—like the Contraband Detector—are analogous to radar guns and detection dogs. All three raise the same fundamental question: In context, does an official using the tool have grounds to meaningfully distinguish true-positives from false-positives? The difficulty with a tool like the Contraband Detector is that its output, unlike that of a radar gun or a drug dog, does not occur in a context (e.g., on a highway) that permits the addition of other variables by an officer, thus facilitating an assessment of relative plausibility, as between a true-positive and a false-positive. In fact, the whole point of a tool like the Contraband Detector is to make predictions from correlative variables *out* of context—a process that, by its nature, frustrates inquiry into the tool's case-by-case performance, as plausibility analysis requires.[99]

III. ARE EXPLANATIONS ILLUSORY?

That "plausible cause" maps neatly onto existing jurisprudence does not necessarily mean, of course, that it is the correct way to conceive of suspicion. For some observers, the pattern traced in the last Part—the Court's affinity for narrative over numbers—is cause for criticism, not praise. Relying on explanations rather than data, the critics argue, makes room for heuristics like "training and experience,"[100] which are amorphous at best, and overtly discriminatory

99. What exactly it would mean to assess the case-specific performance of a tool like the Contraband Detector is a question I reserve for future work; indeed, it is a question that I suspect will occupy the forefront of many discussions about algorithmic governance over the next decade. What does it mean for humans to stay "in the loop" of highly complex decisionmaking tools? In the context of something like the Contraband Detector, what is the quantity and quality of knowledge that an officer would require to put the tool's output into a meaningful analytic relationship with other collected evidence?

100. *See* Bambauer, *supra* note 3, at 463:

> Because the investigation methods approved by courts usually rely on the observations and perceptions of police, the "particularized" evidence is likely to be biased, error prone, and disproportionately aimed at poor and minority residents living in higher-crime areas. Subjective factors like a suspect's "nervousness" or "furtive movements" can be imagined or, worse still, manufactured through deceit.

(footnote omitted);

at worst. From this vantage point, algorithmic solutions like the Contraband Detector promise to reform a status quo that seems, far too often, dominated by whim and "hunch."[101]

The critique is well-taken—but the question, ultimately, is whether we can afford to give up on explanations. In this Part and the next, I will argue that we cannot. The argument has two steps. First, I will show that, contrary to a prominent vein of scholarly criticism today, not all inferences are statistical in nature. Although it is true that all evidence relies, at some level, on generalization, a meaningful line can be drawn between inferences that merely draw predictions from observed facts and inferences that purport to explain those facts. Explanatory power, in other words, is not an epistemic illusion.

Second, I extol the virtues of the explanatory approach to Fourth Amendment suspicion, and of explanatory standards more generally. On that front, the claim—explored in the next Part—is that explanations allow judges to take account of values beyond accuracy, many of which, though simple to state, are quite fundamental to our legal system.

* * *

Particularity is axiomatic to criminal investigation. Open a treatise or casebook, peruse the opening paragraphs of the Supreme Court's latest Fourth Amendment opinion, and a familiar story immediately jumps off the page. Before law enforcement officials may engage in intrusive searches and seizures, they must have reason to suspect *this* particular person, or *that* particular home, is connected to criminal activity.[102]

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id. at 463 n.7 (describing the prominent role that "furtive moments," as an overly thin justification for performing *Terry* stops, played in the NYC stop-and-frisk litigation); *see also* Floyd v. City of New York, 959 F. Supp. 2d 540, 561 (S.D.N.Y. 2013):

> Two officers testified [at trial] to their understanding of the term "furtive movements." One explained that "furtive movement is a very broad concept," and could include a person "changing direction," "walking in a certain way," "[a]cting a little suspicious," . . . "getting a little nervous, maybe shaking," and "*stutter[ing].*" Another officer explained that "usually" a furtive movement is someone "hanging out in front of [a] building, sitting on the benches or something like that" . . . . If officers believe that the behavior described above constitutes furtive movement that justifies a stop, then it is no surprise that stops so rarely produce evidence of criminal activity.

101. *See* Alabama v. White, 496 U.S. 325, 329 (1990) (explaining that at a minimum, a *Terry* stop requires "[t]he officer . . . [to] be able to articulate something more than an inchoate and unparticularized suspicion or hunch" (internal citations omitted) (quoting United States v. Sokolow, 490 U.S. 1, 7 (1989))); Terry v. Ohio, 392 U.S. 1, 21 (1968); *see also, e.g.*, *Floyd*, 959 F. Supp. 2d at 567–68 (discussing the role of hunches in police investigations of suspicion).

102. *See* David A. Harris, *Particularized Suspicion, Categorical Judgments: Supreme Court Rhetoric Versus Lower Court Reality Under* Terry v. Ohio, 72 ST. JOHN'S L. REV. 975, 977 (1998)

Yet in spite of its hallowed status—or perhaps because of it—the particularization norm has proven elusive. Why, exactly, does particularized suspicion matter? What does it mean for an inference of wrongdoing to attach to a specific "person, house, paper [or] effect"? Recently, a number of scholars have argued that particularized suspicion is a mirage.[103] No matter how case-specific a given piece of evidence feels, the way it conveys information about a particular case is by relating that case to broader statistical trends. On this basis, Professor Chris Slobogin has called "the distinction between individualized and generalized suspicion meaningless."[104] And Professor Jane Bambauer has suggested that although "generalizations can be [made] more finely grained . . . the nature of the prediction does not change,"[105] and once it becomes clear that the "difference[ ] between general and particular decisionmaking [is one] of degree and not differences in kind, we [rightly] become . . . skeptical of a widespread

(lamenting that suspicion requirements have eroded to such an extent that "*Terry* . . . [has] become, in practical terms, a decision which legally permits a stop and a frisk of almost anyone, for almost any reason," which the Court "surely . . . did not mean" when it first issued *Terry*); Andrew E. Taslitz, *What is Probable Cause and Why Should We Care?: The Costs, Benefits, and Meaning of Individualized Suspicion*, 73 LAW & CONTEMP. PROBS. 145, 189 (2010) ("The individualized-suspicion requirement protects the uniqueness-fostering function of privacy . . . [requiring suspicion to] result from reliance on a sufficient quality and quantity of evidence to support a reasonable and articulable concern about past or impending criminality *by this person*."); *see also* DAVID GRAY, THE FOURTH AMENDMENT IN AN AGE OF SURVEILLANCE (forthcoming 2017) (manuscript at chs. IV–V) (on file with author) (arguing that the Fourth Amendment's ratification—in response to general warrants and writs of assistance—was largely about limiting the number of people and homes subject to intrusive surveillance); Rich, *supra* note 6, at 900–01 (explaining that the Fourth Amendment is first and foremost about "individualized justice," and according that the Amendment's requirements "would not be satisfied," for example, "if a police agency conducted ten searches, five on suspects who were almost certainly engaged in criminal activity and five on suspects who almost certainly were not, on the ground that on average probable cause existed" (emphasis omitted)); *cf.* Jed Rubenfeld, *The End of Privacy*, 61 STAN. L. REV. 101, 110–15 (2008) (arguing that the police, because of their distinctive status, owe citizens a heightened duty of care that entails, among other things, respect for individuality).

103. *See* SLOBOGIN, *supra* note 8; Bambauer, *supra* note 3; Harcourt & Meares, *supra* note 8; Simmons, *supra* note 8. To date, Bambauer's analysis is the most comprehensive; she sifts through a litany of familiar rationales for individualization, each of which she eventually dismisses as conceptually unfounded, normatively implausible, or both. *See* Bambauer, *supra* note 3, at 468–81; *see also* Shaviro, *supra* note 24, at 537–38 (offering an equivalent argument in the context of trials).

104. SLOBOGIN, *supra* note 8, at 40; *see also* Harcourt & Meares, *supra* note 8, at 850 ("If anything, the 'individualized suspicion' construct prevents courts from conducting the right inquiry," which "turns on the quantum of evidence [needed to establish a sufficient level of true positives], not on whether [the evidence] is 'individualized' or not." (emphasis omitted)).

105. Bambauer, *supra* note 3, at 472.

but mistaken view that the particular has . . . primacy over the general."[106] Other scholars echo these views.[107]

Consider an example. Police often rely on sensory observation to justify stops. "The car was weaving; the driver seemed intoxicated." At first blush, this sort of evidence may seem quintessentially particularized; it pertains to one particular car and one particular driver. But what is this evidence, really, apart from a claim—maybe true, maybe not—about why cars tend to weave? By saying, "The driver seemed intoxicated," what the officer means is that, based on background knowledge, a common reason cars swerve is that the driver has ingested alcohol or drugs. Can this be coherently described as "particularized" evidence? It is certainly a general observation applied to a particular set of observed facts. But on that view, *all* evidence is particularized, so long as it is deployed in a specific case. That hardly seems like what proponents of particularity have in mind.

Take this epistemic point seriously, the skeptics argue, and it follows that "particularity" cannot truly be about the nature of the evidence from which wrongdoing is inferred. So—the argument goes—it must be about limiting the set of "person, houses, papers and effects" subject to intrusion in practice. In other words, when we ask if an inference of wrongdoing is "particularized," what we are *really* asking is whether it stems from an investigative method that tends, as an empirical matter, to pick out wrongdoing—instead of sweeping in innocent conduct.[108]

The skeptics are correct in one sense, wrong in another. It is true, at some level, that all evidence is statistical. But the skeptics move too quickly from the idea that all evidence is statistical to the notion that predictive accuracy forms the exclusive anchor of particularity. Even if all evidence is statistical—even if "case-specific" evidence is an

106. *Id.* (citing FREDERICK SCHAUER, PROFILES, PROBABILITIES, AND STEREOTYPES 106 (2003)); *see also* Bacigal, *supra* note 7, at 297 (arguing that "[a]ll evidence is probabilistic, requires inferences to support an ultimate conclusion, and thus involves a risk of error" and that "[s]tatistical evidence is different only in that it makes these uncertainties explicit"). Apart from these full-blown defenses of accuracy, there are a number of articles that try to "put the probability back in probable cause," and in doing so, seem to presuppose that accuracy is the main, if not exclusive, value anchoring Fourth Amendment law. *See, e.g.*, Goldberg, *supra* note 10; Minzner, *supra* note 10. *But see* Chris William Sanchirico, *Character Evidence and the Object of Trial*, 101 COLUM. L. REV. 1227, 1260–61 (2001) (distinguishing between "trace" and "character" evidence in an effort to neutralize the "all evidence is statistical" objection).

107. *See e.g.*, Harcourt & Meares, *supra* note 8; Simmons, *supra* note 8.

108. *See* SLOBOGIN, *supra* note 8, at 39–47 (developing a "proportionality" view of Fourth Amendment suspicion that focuses on the strike rates of different investigative methods—measured against intrusiveness—and explicitly eschews the "myth of individualized suspicion"); Bambauer, *supra* note 3, at 482–83 (arguing that the Fourth Amendment is designed to ensure a reasonable balance between "hit" and "hassle" rates).

illusion—there can still be case-specific *explanations* of evidence. In other words, there is an important difference between constellations of (statistical) evidence that support explanatory accounts of wrongdoing and constellations of (statistical) evidence that do not. What makes a theory of wrongdoing particularized is not the epistemic status of each piece of evidence on which the theory rests. It is the relationship *between* those pieces of evidence. As we saw in the last Part, this is the notion of particularity that animates the Court's suspicion jurisprudence—and it is the one I defend in the next Part.

IV. WHY EXPLANATIONS MATTER

Explanations matter—and explanatory standards ought to be preserved, even in an age of powerful machines—because they enable consideration of two sets of values beyond accuracy. The first consists of constitutional constraints; in what follows, I will focus specifically on the First Amendment and the Equal Protection Clause. The second consists of general legality principles, rooted doctrinally in the Due Process Clause but at some level suffused throughout legal decisionmaking, which separate lawful uses of state power from ultra vires conduct. In both cases, explanations further the same goal. They permit judges—and ultimately, the polity—to decide whether police conduct, whatever its accuracy, meshes with recognized limitations on the exercise of power.

The idea here is simple: we cannot effectively regulate what we do not understand. Whether that "we" refers to judges, reviewing decisions case-by-case, or to legislatures and administrative bodies, setting rules across the board, the point stands.[109] Accuracy is not the be-all and end-all of sound decisionmaking. This does not mean that accuracy is irrelevant. It is certainly *a* value we care about.[110] But it is

109. *See, e.g.*, Paul W. Kahn & Kiel Brennan-Marquez, *Statutes and Democratic Self-Authorship*, 56 WM. & MARY L. REV. 115, 173–77 (2014) (arguing that legislation and judicial review share a common goal of reinforcing popular sovereignty by producing legal rules, and specific interpretations of those rules, that the people can imagine themselves as having authored). Part of my aim here is to highlight the complementary role that judges, in reviewing individual cases and addressing specific grievances in the Fourth Amendment setting, play vis-à-vis administrative governance structures. On the latter front, see, for example, Barry Friedman & Maria Ponomarenko, *Democratic Policing*, 90 N.Y.U. L. REV. 1827 (2015); Daphna Renan, *The Fourth Amendment as Administrative Governance*, 68 STAN. L. REV. 1039 (2016); and Christopher Slobogin, *Policing as Administration*, 165 U. PA. L. REV. 91 (2016). In my view, the idea of applying administrative law norms to policing makes good sense—in fact, it is long overdue—but I think it should supplement, not substitute for, the systemic constraints imposed by Fourth Amendment rules.

110. This is true for both intrinsic and instrumental reasons. Accuracy is good as such—and error, bad as such—which by itself counsels in favor of paying attention to accuracy rates. But observations of accuracy (as well as inaccuracy) also help to assess the strength (or weakness) of

not the *only* value we care about. Other values matter. And explanatory standards allow conflict between divergent values to be managed.[111]

A. Constitutional Values

To begin with, explanations help to safeguard constitutional values. Suppose it comes to light that the Contraband Detector draws largely, or even primarily, on targets' political associations or religious affiliations to predict wrongdoing.[112] Or suppose it turns out that race—or a close proxy for race, such as arrest history or zip code—has substantial weight in the tool's model.[113]

Revelations like these would give many of us pause, regardless of whether these variables predict wrongdoing in a statistical sense. If

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commonly offered explanations. A helpful example is the New York City stop-and-frisk litigation. There, one of the key facts—anchoring Judge Scheindlin's holding that the NYPD's policy systematically violated Fourth Amendment rights—was its abysmal true-positive rate. *See* Floyd v. City of New York, 959 F. Supp. 2d 540, 558 (S.D.N.Y. 2013) (finding that only six percent of stops led to arrests, and much fewer to the discovery of weapons). It is possible, of course, to describe this deficiency solely in terms of accuracy—that is, to suggest that the problem with stop-and-frisk was its poor predictive performance. *See, e.g.*, Bambauer, *supra* note 3, at 488–90 (offering an argument to that effect). But in my view, the more plausible construction of Judge Scheindlin's opinion is that the program's dismal true-positive rate not only raises eyebrows under an accuracy model; it *also* casts doubt on the intelligibility of a large portion of routine stops. In her holding as to *Monell* liability, for example, Judge Scheindlin made clear that a six percent hit rate was of a piece, conceptually, with (1) the finding that "36% of [stop-and-frisk reports]" failed to "identify a suspected crime" *at all*, and (2) the finding that the "two most commonly checked stop factors," namely, "Furtive Movements" and "High Crime Area," were too boilerplate to be meaningful. *Floyd*, 959 F. Supp. 2d at 660. In Judge Scheindlin's view, all three pieces of evidence spoke to the same core problem: that the NYPD had effectively created a climate of ubiquitous stops, in which everyone was (potentially) suspicious at any moment, with no intelligible link to actual behavior. *Id.* (concluding that the thin justifications offered on many stop-and-frisk reports, coupled with the low true-positive rate, indicated that the NYPD had made effectively suspicionless stops part of its "standard operating procedure"); *see, e.g.*, Tracey L. Meares, *Programming Errors: Understanding the Constitutionality of Stop-and-Frisk as a Program, Not an Incident*, 82 U. CHI. L. REV. 159 (2015).

111. It bears noting that explanatory standards do not necessarily subtract from statistical accuracy; indeed, they might actually *enhance* statistical accuracy. Which way they cut is an empirical question, wholly dependent on context—it turns on whether human oversight of an otherwise-automated predictive process stands to *correctly exclude* false-positives or, rather, to *incorrectly exclude* true-positives. *See, e.g.*, Rich, *supra* note 6, at 899.

112. This has been a long-standing criticism of the FBI's so-called "no-fly list," which recently provoked a lawsuit alleging that the list includes a disproportionate number of Muslims. *See, e.g.*, Bamzi Banchiri, *No Fly-List: Vital Security Measure or State-Sanctioned Religious Profiling?*, CHRISTIAN SCI. MONITOR (Apr. 5, 2016), http://www.csmonitor.com/USA/Justice/2016/0405/No-fly-list-vital-security-measure-or-state-sanctioned-religious-profiling-video [https://perma.cc/SF82-TUJ9].

113. *See, e.g.*, Lauren Kirchner, *When Discrimination Is Baked into Algorithms*, ATLANTIC (Sept. 6, 2015), https://www.theatlantic.com/business/archive/2015/09/discrimination-algorithms-disparate-impact/403969/ [https://perma.cc/BUY7-TMP9] (exploring the way that zip code information—among other inputs—ends up contributing to disparities in algorithmic decisionmaking).

they do not, so much the worse: sensitive variables have been used gratuitously.[114] But even if they do, it would still be troubling, because the notion that one's political views, religious convictions, or race could give rise to an outsized risk of intrusion by the state is cause for constitutional concern *no matter* the variables' probative value.[115] This does not mean, of course, that sensitive variables must be banished from suspicion decisions outright. But it does mean that theories of wrongdoing that make use of such variables demand more exacting scrutiny—a judicial function that automation, even if carried out by a very powerful machine, would be unable to replicate.

To begin with, consider First Amendment–sensitive variables. The Supreme Court has long recognized the importance of caution—and the need for constitutional balancing—when the enforcement of criminal law bears on expression or association. When the state draws on information about one's beliefs or associations to make adverse decisions, it freights the exercise of First Amendment rights; accordingly, the Court has developed a tailoring regime that asks whether expressive or associational data was necessary to serve the interests at hand and whether its use was adequately cabined to avoid constitutional problems.

Take *Dawson v. Delaware*,[116] which held that petitioner's associational rights were infringed when, at sentencing, the state adduced his membership in the Aryan Brotherhood as evidence of bad character. In arriving at this result, the Court explicitly rejected petitioner's view that all "beliefs [and] activities" are off-limits as aggravating evidence.[117] "[T]he Constitution," the Court made clear, "does not erect a *per se* barrier to the admission of evidence concerning one's beliefs and associations . . . simply because those beliefs and associations are protected by the First Amendment."[118] The problem in Dawson's case, however, was that membership in the Aryan

114. In practice, this is a huge problem. For the foreseeable future, in fact, it may be the most important problem we face. *See, e.g.*, Julia Angwin, Jeff Larson, Surya Mattu & Lauren Kirchner, *Machine Bias*, PROPUBLICA (May 23, 2016), https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing [https://perma.cc/EPC8-APAT] (excavating examples of racial disparities in the outputs of a recidivism algorithm that ended up being wildly wrong).

115. *See* RONALD DWORKIN, TAKING RIGHTS SERIOUSLY 13 (1978) ("[I]t is unjust to put someone in jail on the basis of a judgment about a class, however accurate, because that denies his claim to equal respect as an individual."); Andrea Roth, *Trial by Machine*, 104 GEO. L.J. 1245 (2016) (exploring how data analysis is deployed by courts asymmetrically—often to intensify punitive measures—and arguing that the resulting distributive effects are lamentable regardless of underlying accuracy).

116. 503 U.S. 159 (1992).

117. *Id.* at 164.

118. *Id.* at 165.

Brotherhood pointed only to "abstract beliefs."[119] It would have been one thing, the Court reasoned, for the state to use Dawson's association to show that he, in particular, was of poor character. But letting the jury draw a negative inference from the association by itself was a bridge too far.

Similar reasoning was on display, this time at the guilt stage, in *Virginia v. Black*.[120] There, the Court struck down a portion of a Virginia statute banning cross-burning, on the grounds that it allowed the fact that a cross was burned—absent independent mens rea evidence—to serve as "prima facie evidence of an intent to intimidate."[121] This, the Court reasoned, made it at least theoretically possible that someone could be convicted under the statute for engaging in no more than First Amendment–protected activity. What if, for example, the cross-burning occurred at a Ku Klux Klan rally on private property, as an expression of support for the group's ideology? The possibility that a person could, in principle, be convicted on that basis alone was too much for the Court.

As First Amendment cases go, *Dawson* and *Black* are outliers, in that neither case involved punishment directly on the basis of an association or belief (or on the basis of speech or religion).[122] Rather, both involved an effort by the state to draw normal evidentiary inferences that, if based solely on unprotected conduct, would be entirely permissible, but that, in practice, could too easily be based on protected conduct. In other words, it was the difficulty of collating between protected and unprotected conduct, due to their functional similarities, that bothered the Court. Even *Black*, the closer of the two cases, simply involved the risk that protected conduct would *erroneously* form the basis of punishment—due to jury confusion—since there was no doubt that the conduct actually proscribed by the statute (burning a cross with the intent to intimidate) was, and remains, unprotected.

The best way to parse the normative principle underlying *Dawson* and *Black*, then, is this: because expressive activity comes in protected and unprotected forms, before the state may rely on

119. *Id.* at 166–67.

120. 538 U.S. 343 (2003).

121. *Id.* at 348.

122. *See, e.g.*, United States v. Alvarez, 132 S. Ct. 2537, 2547 (2012):

> Permitting the government to decree this speech to be a criminal offense, whether shouted from the rooftops or made in a barely audible whisper, would endorse government authority to compile a list of subjects about which false statements are punishable. That governmental power has no clear limiting principle. Our constitutional tradition stands against the idea that we need Oceania's Ministry of Truth.

expressive activity as the linchpin of adverse treatment, it must demonstrate an effort to tailor; it must show that some attempt was made to distinguish unprotected versions of expressive activity from their protected counterparts.[123] Thus, Dawson's affiliation with the Aryan Brotherhood might have been admissible—had the state shown that something about *his* affiliation, in particular, suggested poor character—and Mr. Black's conviction might have been sound, if the jury charge had distinguished more finely between cross-burning that is merely expressive and cross-burning that is not.

From a purely evidentiary standpoint, this "tailoring" logic rings strange. It seems implausible, to say the least, that affiliation with a prison gang is *not probative* of poor character,[124] or that the act of cross-burning is *not probative*—on its face—of an intent to intimidate. But this simply speaks to how porous a category "probative value" is. Probative is not the same as dispositive. To say that affiliation with a prison gang is probative of bad character, or that cross-burning is probative of intent to intimidate, is not the end of the matter; it is the *beginning* of the matter. Mr. Dawson was free, of course, to introduce evidence of good character—which he did—and also free to rebut the proposition that, either in his case or in general, affiliation with the Aryan Brotherhood implies bad character. Likewise, any defendant prosecuted under the Virginia cross-burning statute at issue in *Black* would be free to introduce facts—including live testimony from the defendant himself—that tend to disprove intent to intimidate. Indeed, that is exactly what it means for the fact of cross-burning to operate as prima facie evidence: it is probative only "on its face," that is, only until rebutted.[125]

None of this, however, seemed to matter much to the majorities in *Dawson* and *Black*. Rather, the upshot of both cases is that some inferences, regardless of probative value, cut too close to First Amendment rights to be permissible. More specifically, before the state may employ such inferences, it must work, as it failed to do in both

123. For an illuminating analysis of another realm where protected and unprotected forms of expression blur—and similar First Amendment concerns arise—see Andrew Gilden, *Punishing Sexual Fantasy*, 58 WM. & MARY L. REV. 419 (2016) (examining criminal punishments for exploration of sexual fantasies online).

124. As Justice Thomas, dissenting in *Dawson*, put it, "Jurors do not leave their knowledge of the world behind when they enter a courtroom," and because of this, "[d]enying that [Mr.] Dawson's gang membership told the jury anything about his activities, tendencies, and traits—his 'character'—ignores reality." *Dawson*, 503 U.S. at 171–72 (Thomas, J., dissenting).

125. *Black*, 538 U.S. at 369–70 (Scalia, J., concurring in part, concurring in the judgment in part, and dissenting in part) ("The established meaning . . . of the term 'prima facie evidence' [is] perfectly orthodox: It is evidence that suffices, on its own, to establish a particular fact. But it is hornbook law that this is true only to the extent that the evidence goes unrebutted.").

Dawson and *Black*, to ensure that First Amendment values have been accommodated.

This principle applies with equal force to suspicion decisions. For one thing, nothing in the principle's logic gives rise to a meaningful distinction between suspicion, on one hand, and guilt and sentencing, on the other. The heart of the principle is that First Amendment concerns transcend probative value—and probative value is just as operative at the suspicion stage as elsewhere. It is certainly possible that First Amendment values are *less* important at the suspicion stage than they are at the guilt or sentencing stages. But the key proposition, when it comes to justifying explanatory standards and corresponding oversight, is simply that First Amendment values matter. How much they matter is a question to be answered in the performance of oversight; to justify the need for oversight, the important point is that First Amendment values matter *at all*. That is what necessitates case-specific, value-sensitive review.

Second, the Supreme Court has already recognized the importance of First Amendment values in the surveillance context—specifically, in its "freedom of association" jurisprudence. Reaching back to the canonical case of *NAACP v. Alabama*, where the Court quashed a subpoena seeking to obtain the NAACP's membership list, likening it to "[a] requirement that adherents of particular religious faiths or political parties wear identifying arm-bands,"[126] the Court has long recognized that information-gathering practices meet with different scrutiny depending on the First Amendment interests involved.[127]

The same holds true for probable cause determinations. As Professor Kathy Strandburg has shown, the principle underpinning the Court's freedom of association cases is, at base, a tailoring requirement: the collection and use of associational data must "promote a specific compelling government interest," must "have a sufficiently close nexus to that specific interest," and "must be necessary, in the sense that there are no substantially less burdensome means to achieve that specific

126. 357 U.S. 449, 462 (1958) ("We think that the production order, in the respects here drawn in question, must be regarded as entailing the likelihood of a substantial restraint upon the exercise by petitioner's members of their right to freedom of association."). For a more contemporary example, see *United States v. Jones*, 565 U.S. 400, 415 (2012) (Sotomayor, J., concurring) (arguing that GPS monitoring should qualify as a Fourth Amendment "search"—requiring probable cause—because it "generates a precise, comprehensive record of a person's public movements that reflects a wealth of detail about her familial, political, professional, religious, and sexual associations").

127. *See* Linda E. Fisher, *Guilt by Expressive Association: Political Profiling, Surveillance and the Privacy of Groups*, 46 ARIZ. L. REV. 621 (2004); Katherine J. Strandburg, *Freedom of Association in a Networked World: First Amendment Regulation of Relational Surveillance*, 49 B.C. L. REV. 741 (2008).

interest."[128] In the suspicion context, the first two conditions are virtually always satisfied. Apprehending criminals is undoubtedly a "specific compelling interest," and explanations adduced in pursuit of that purpose self-evidently satisfy the "close nexus" requirement. But the third requirement—necessity—reintroduces some play in the joints. When reviewing explanations offered by police to justify inferences of wrongdoing, judges have an opportunity to ask if associational data is "necessary." In other words, could the same investigative goals have been served in the *absence* of associational data? If so, further scrutiny is warranted, because the tension between First Amendment values and statistical likelihood—however great—has not been properly balanced.

* * *

On the equal protection side, the law is murkier—not least because the state rarely invokes race, the way it sometimes invokes association or belief, as a variable in adverse decisionmaking. Moreover, the Supreme Court has never addressed the proper use of race in suspect-profiles (e.g., when police target individuals based on physical descriptions—"White male between 18–24 with a red hoodie"—offered by victims or witnesses). But there are a number of appellate cases on point, and they speak uniformly: the use of race in suspect-profiles, based on witness or victim testimony, does not qualify as a race-based classification subject to strict scrutiny.[129] As the U.S. Court of Appeals for the Sixth Circuit once summed it up, invoking "common sense" as authority: "when determining whom to approach as a suspect of criminal wrongdoing, a police officer may legitimately consider race as a factor if descriptions of the perpetrator known to the officer include race."[130]

Whether or not this reasoning is sound, and there are plenty who think it is not,[131] the use of race in suspect-profiles stands in sharp

128. Katherine J. Strandburg, *Membership Lists, Metadata, and Freedom of Association's Specification Requirement*, 10 I/S: J.L. & POL'Y FOR INFO. SOC'Y 327, 331 (2014) (emphasis omitted); *see also* Deven R. Desai, *Constitutional Limits on Surveillance: Associational Freedom in the Age of Data Hoarding*, 90 NOTRE DAME L. REV. 579 (2014).

129. *See, e.g.*, United States v. Davis, 200 F.3d 1053 (7th Cir. 2000); Brown v. City of Oneonta, 221 F.3d 329 (2d Cir. 1999); United States v. Lopez-Martinez, 25 F.3d 1481 (10th Cir. 1994).

130. United States v. Waldon, 206 F.3d 597, 604 (6th Cir. 2000).

131. *See, e.g.*, Brown v. City of Oneonta, 235 F.3d 769, 779–92 (2d Cir. 2000) (Calabresi, J., dissenting—vociferously—from denial of rehearing en banc). For background on the debates surrounding race-based suspect-profiles, see R. Richard Banks, *The Story of* Brown v. City of Oneonta*: The Uncertain Meaning of Racially Discriminatory Policing Under the Equal Protection Clause*, *in* CONSTITUTIONAL LAW STORIES 223 (Michael C. Dorf ed., 2004).

contrast to the use of race *in general* to guide law enforcement. The U.S. Court of Appeals for the Second Circuit, for example, has made clear, in the course of upholding the use of race in suspect-profiles, that it would not be acceptable under the Equal Protection Clause for the police to "use[ ] an established profile of . . . criminal[ity]" based on race, or to adopt a "regular policy based upon racial stereotypes."[132] In other words, even in the sensitive context of race, courts have sought to strike a balance: distinguishing between different uses of race, and weighing the value of those uses in the law enforcement process against countervailing constitutional values.

The key question, of course, is what makes a "profile of criminality" based on race—and similarly, what constitutes "racial stereotypes" in the formulation of policy. Furthermore, how do proxy variables—i.e., variables apart from race that closely track race at a functional level—fit into this picture? These questions are not easy, and new technology has only magnified the difficulty. The outputs of machine learning algorithms confirm, and render tangible, what sociologists have long understood: that in a nation like ours, with its history of de jure and de facto racial subordination, interwoven with other forms of structural inequality, *many* variables serve as proxies for race. Zip codes are perhaps the best-known example, with their overt connection to hideous practices of mortgage-redlining.[133] But zip codes are just the tip of the iceberg. Going forward—in a world of algorithmic decisionmaking where seemingly disparate variables become increasingly hard to disentangle—we will likely need to reconsider which variables qualify as sensitive by virtue of their connection to race (as well as gender, and other traditionally protected categories).[134]

In short, there is great indeterminacy today about what constitutes a "proxy variable." If anything, however, this indeterminacy intensifies the need for oversight. One piece of the puzzle is judicial: by requiring police to explain their inferences of wrongdoing, judges can consider whether those explanations track known proxies for race, gender, and other protected categories. As just one example, in the recent challenge to New York City's (now reformed) stop-and-frisk program, Judge Scheindlin of the Southern District of New York

132. *Brown*, 221 F.3d at 337.

133. *See, e.g.*, Sarah Ludwig, *Credit Scores in America Perpetuate Racial Injustice. Here's How*, GUARDIAN (Oct. 13, 2015), https://www.theguardian.com/commentisfree/2015/oct/13/your-credit-score-is-racist-heres-why [https://perma.cc/X3N5-2UPV].

134. For a discussion of this question—in the employment setting, but presenting identical issues—see Barocas & Selbst, *supra* note 17; *see also* Pauline T. Kim, *Data-Driven Discrimination at Work*, 58 WM. & MARY L. REV. (forthcoming 2017).

recognized that reports of "furtive movement," offered by NYPD officers to justify *Terry* stops, often operated as a proxy for race in practice.[135]

Another piece of the oversight puzzle is legislative.[136] As a polity, we are free to set the parameters of a category like "proxy variable" as we see fit; though seemingly descriptive, even scientific, in some sense the category simply consists of normative designations about which variables are fair bases for decisions and which are not. To make such designations properly, however, we must understand which variables are actually being used. Knowing what kinds of variables officials rely on to justify the use of power—which can only come through explanations—is a precondition of regulating those variables.

B. Rule-of-Law Values

Apart from safeguarding constitutional values, explanations also vindicate rule-of-law principles. A key tenet of legality, separating lawful authority from ultra vires conduct, is the idea that not all explanations qualify as justifications.[137] An official cannot, for example, rely on the explanation that he strongly *wished* to perform Act *X* as authority to perform Act *X*. Nor can he rely on the explanation that God told him to. Nor, at least under normal circumstances, can he rely on

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135. *See* Floyd v. City of New York, 959 F. Supp. 2d 540, 578 (S.D.N.Y. 2013):

> Many of the checkboxes on the [*Terry* stop form] that officers use to indicate the basis for a stop are problematic. "Furtive Movements" is vague and subjective. In fact, an officer's impression of whether a movement was "furtive" may be affected by unconscious racial biases. "Fits Description" is a troubling basis for a stop if the description is so general that it fits a large portion of the population in the area, such as black males between the ages of 18 and 24.

136. It bears noting that the validity of democracy-focused argumentation in constitutional law is a source of controversy. I will not endeavor to comment on (much less to resolve) that controversy here, except to note my sympathy with democracy-enhancing conceptions of judicial review. *See generally* STEPHEN BREYER, ACTIVE LIBERTY: INTERPRETING OUR DEMOCRATIC CONSTITUTION (2005) (arguing that constitutional jurisprudence should proceed with an eye to facilitating participatory governance); JOHN HART ELY, DEMOCRACY AND DISTRUST: A THEORY OF JUDICIAL REVIEW (1980) (arguing that judicial review is legitimate only insofar as it enhances democratic structures of governance).

137. *See, e.g.*, Encino Motorcars, LLC v. Navarro, 136 S. Ct. 2117, 2125 (2016) (explaining that agency rulemaking is "procedurally defective" and unworthy of *Chevron* deference, when, among other things, the "agency [fails to] give adequate reasons for its decisions," because that renders the decisions "arbitrary and capricious and [incapable of] carry[ing] the force of law"); Malcolm Thorburn, *Justifications, Powers, and Authority*, 117 YALE L.J. 1070, 1103–07 (2008) (describing the warrant requirement, and other doctrines that legitimize police officers, as conceptually akin to justification rules in criminal law); *see also* Kevin M. Stack, *The Constitutional Foundations of* Chenery, 116 YALE L.J. 952 (2007) (exploring the importance of reason-giving in administrative law). In this vein, it is worth remembering that warrants operate as a species of "justification" for otherwise illicit activity (such as trespass). It is imperative, therefore, that the basis for warrants—as a basis for legal justification—stay amenable to democratic oversight.

the explanation that a good reason for performing Act *X* exists, but, alas, he cannot divulge what it is.

These are just three examples of explanations that do not qualify as justificatory. What unites them, for our purposes, is that all three flout legality principles. Most importantly, they flout the idea that law's mandates cannot be unduly vague—that both state officials and members of the public must have a predictable sense ex ante of what conduct is and is not allowed.

As the Supreme Court, echoing generations of legal philosophy,[138] has made clear, the prohibition on vagueness serves two interconnected goals. First, it gives members of the public "fair notice" about what conduct invites punishment—or, in the context of enforcement, what conduct invites intrusion. Second, it constrains the state's discretion. Vague legal bounds "permit a standardless sweep [that] allows policemen, prosecutors, and juries to pursue their personal predilections."[139] Sometimes, this is a necessary evil, to the extent that legal standards defy principled articulation; the Court has suggested, for instance, that disturbance of the peace may be an example of a permissibly vague prohibition, to the extent that it demands "on-the-spot assessment of the need to keep order."[140] But this is an exception, and the general rule could not be clearer: where vagueness "permits . . . selective law enforcement, there is a denial of due process."[141] Furthermore, the prohibition on vagueness, though often discussed in the context of prosecution,[142] indisputably extends to policing. In fact, policing and prosecution are two sides of the same coin: a standard that, due to vagueness, enables discretionary prosecution is equally unacceptable for leaving enforcement decisions to the "whim of . . . police."[143]

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138. The best known example, though certainly not the only example, of this theme in legal philosophy comes from Lon Fuller's famous thought experiment about Rex, an imaginary king who tries to reform the legal system to better accommodate his benevolence, but who finds himself running into various legality principles in the meantime. *See* LON L. FULLER, THE MORALITY OF LAW 137–38 (rev. ed. 1969). For an excellent contemporary example in the same vein, see SCOTT J. SHAPIRO, LEGALITY 73–76 (2011).

139. Kolender v. Lawson, 461 U.S. 352, 358 (1983) (alteration in original) (internal quotation marks omitted); *see also* Smith v. Goguen, 415 U.S. 566, 575 (1974) (arguing that the Constitution stands "against entrusting lawmaking to the moment-to-moment judgment of the policeman on his beat" (internal quotation marks omitted)).

140. *Goguen*, 415 U.S. at 581.

141. *Id.* at 576.

142. For the Court's most recent elaboration, see *Johnson v. United States*, 135 S. Ct. 2551 (2015) (holding the Armed Career Criminal Act's "residual clause"—a provision only triggered at sentencing, and thus one that had no effect on policing—unconstitutional on vagueness grounds).

143. Shuttlesworth v. City of Birmingham, 382 U.S. 87, 90 (1965). For other reasoning to this effect, see Orin S. Kerr, *Vagueness Challenges to the Computer Fraud and Abuse Act*, 94 MINN. L. REV. 1561, 1574–75 (2010) (collecting and summarizing cases).

Both goals of the prohibition on vagueness—giving notice to the public and constraining the discretion of officials—are implicated by the methods police use to generate probable cause. Moreover, unexplained inferences of wrongdoing, such as outputs from the Contraband Detector, fail on both fronts at once.

First, unexplained inferences of wrongdoing fail to give individuals adequate notice of the law's content. Consider a simple hypothetical—or, rather, twin hypotheticals.

- Scenario One: The police show up at Lyra's door with a valid warrant, demanding entry. Lyra lets the police in, and they proceed to toss her apartment. After an hour, with the apartment in disarray, the police come up empty-handed. They leave. Upset about the encounter, Lyra gets in touch with her local precinct, seeking to determine why the search of her apartment was warranted. Eventually, a supervisor explains that the police had reason to suspect that an illicit gambling ring is being run out of Lyra's building; that the layout of Lyra's apartment and its proximity to the building's back door would make it particularly easy to set up a makeshift gambling parlor; and that other tenants reported visitor patterns to and from Lyra's apartment over the last few weeks consistent with a gambling ring. (In fact, Lyra just returned from a multi-week vacation, during which time her younger brother—a wild law student—was using the apartment to throw parties.)

- Scenario Two: Same facts as Scenario One, except that when Lyra asks about the basis for the warrant, she instead receives the following response: "*Your apartment was flagged as "suspicious" by the Contraband Detector, a tool we use to locate gambling rings around the city.*" When Lyra asks what variables the tool relies on—in other words, what about her conduct triggered the tool's "suspicious" designation?—the supervisor concedes that he does not know. The tool uses hundreds of input-variables. No one in the department understands how it works. The supervisor also assures Lyra, however, that the Contraband Detector performs very reliably across cases; in fact, the Department recently brought in a team of data scientists to audit the tool, who report that it recently cleared an eighty percent true-positive rate.

What is the difference between these scenarios? In both cases, it would be natural for Lyra to be frustrated about the intrusion she was forced to endure. And reasonable minds could disagree, I think, about which investigative method—traditional boots-on-the-ground exploration or the use of automated detection tools—is preferable, all things considered.[144] It is easy to imagine Lyra expressing greater dismay in Scenario Two ("How can the police barge into my apartment just because it came up on some database?"), but equally easy, I think, to imagine her expressing a *preference* for Scenario Two, particularly if—perhaps based on her community's experience with law enforcement—she regards traditional police investigation as a means, too often, of abuse and pretext.

In terms of legality principles, however, the trouble with Scenario Two is that it fails to establish a discernible ex ante benchmark of suspicious conduct. This has two consequences. First, it leaves members of the public (like Lyra) without any sense of what activity occasions intrusion. Of course, Scenario One also involves a significant amount of uncertainty. Before the fact, it is unlikely that Lyra could have predicted that her brother's use of the apartment in her absence, coupled with the details of its layout and place in the building, would arouse police suspicion. And it is even less likely that Lyra would have taken steps to *prevent* police intrusion.

But the point of the "fair notice" principle is not that all members of the public must be able to exactly predict—and avoid—all conduct that could conceivably lead to intrusion or punishment down the line. The point is that an average person must have *some* sense of what falls on that side of the line. Although the law need not adhere to "impossible standards of clarity,"[145] it must have enough "definiteness that ordinary people can understand what conduct is prohibited."[146] There is a difference, in other words, between "an imprecise but comprehensible normative standard" and "no standard of conduct . . . at all."[147] Unexplained inferences of wrongdoing—even statistically powerful ones—fall in the latter category.

Second, and more importantly, Scenario Two raises concerns about law enforcement discretion. Absent an explanatory

144. It is not inconceivable, for instance, that populations in highly policed neighborhoods would prefer the use of automated detection tools—if only for reasons of damage control—given the sheer amount of interference with everyday life occasioned by traditional boots-on-the-ground investigation. *Cf.* Bambauer, *supra* note 3, at 482 (noting that traditional policing methods "distribute their intrusions in severely regressive ways").

145. Kolender v. Lawson, 461 U.S. 352, 361 (1983) (internal quotation marks omitted).

146. *Id.* at 357.

147. Coates v. City of Cincinnati, 402 U.S. 611, 614 (1971).

requirement—under a purely statistical conception of suspicion—police would be empowered to act on any strong correlation, no matter its intelligibility. This, in turn, would allow them to make targeting decisions absent judicial supervision: the exact phenomenon the Fourth Amendment originally was designed to rein in.[148]

It may seem odd to describe unexplained-but-powerful inferences as an enabling condition of discretion; after all, one of the great promises of machine learning tools like the Contraband Detector (or its real-world equivalent) is that it *at least* supplants traditional investigative methods, which fare notoriously poorly on statistical metrics. The difficulty is that the discretion prong of anti-vagueness doctrine does not focus on *which* individuals are targeted or *how many* individuals are targeted. It focuses on the targeting of individuals, period—the envisioned harm is that of police enjoying "complete discretion . . . to determine whether [a] suspect . . . must be permitted to go on his way."[149]

The problem with vague standards, in other words, is not that they give police cover to make incorrect decisions; it is that they give police cover to make *unaccountable* decisions. And this is clearly true of the Contraband Detector (and of unexplained decisions in general). Imagine, for example, if the tool turned up one thousand residences in New York City, all eighty percent likely to contain illegal weapons. (In other words, imagine if the tool was capable of identifying one thousand residences, eight hundred of which are connected to wrongdoing.) One thing the NYPD might do in response is seek warrants to search all one thousand residences. More likely, however, the NYPD would begin picking and choosing among targets, knowing that in every case a warrant would be guaranteed to issue. It is precisely this style of discretion that the Fourth Amendment was ratified at the Founding to protect against—and likewise, that vagueness rules aim to combat.[150]

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148. *See* United States v. Knotts, 460 U.S. 276, 284 (1983) (implying that "dragnet type law enforcement practices" are particularly suspect under the Fourth Amendment); Berger v. New York, 388 U.S. 41, 65 (1967) (Douglas, J., concurring) (explicating the prohibition against general warrants as a concern about "dragnet, sweeping" intrusions "upon the privacy of those not even suspected of crime"). The Fourth Amendment's aversion to dragnet surveillance is a prominent theme among scholars. *See, e.g.*, Katherine J. Strandburg, *Home, Home on the Web and Other Fourth Amendment Implications of Technosocial Change*, 70 MD. L. REV. 614, 667 (2011) ("Supreme Court opinions have repeatedly recognized the danger that technological advances might turn plain view observation into constitutionally troubling dragnet searches.").

149. *Kolender*, 461 U.S. at 358.

150. At a normative level, the reasoning here is related to the First Amendment and equal protection values described above: part of why discretion is worrisome is that we worry about police making targeting decisions (absent judicial oversight) that implicate First Amendment and equal protection concerns.

Fortunately, explanations address both ailments—lack of notice and unsupervised discretion—in one swoop. Explanations do this by enabling consideration of the "other side of the story." They allow judges to compare law enforcement's theory of wrongdoing to the strongest innocent version of events (that a judge can imagine) and decide which account of observed facts, in context, is most convincing.

This analytic process serves a dual purpose. First, it guarantees that the reasons for intrusion are, at least to some extent, predictable, because it ties intrusion to activity that *appears more plausibly guilty than innocent*. Second, the "other side of the story" principle constrains police discretion. This is true in two ways. For one thing, it requires police to expend the resources necessary to develop genuine *theories* of wrongdoing, instead of relying on untailored—if powerful—predictive shorthand. For another thing, it ensures that suspects are "represented" in the warranting process, despite the absence of a formal adversarial dynamic. Suspicion decisions happen behind closed doors for a reason: it would subvert the investigation process to permit (much less require) suspects to be fully represented in the process. From this, however, it hardly follows that suspects are entitled to no voice. Nor does the ex parte nature of warranting vitiate the state's burden of proof. Before the police may intrude on private life, they must persuade a judge that intrusion is warranted. And that requires an explanation.[151]

In adversarial settings, this dynamic—and its normative value—is obvious. In everyday motion practice, no less than trial, we ensure that affected parties' perspectives are taken into account by having counsel represent them. Indeed, many of our procedural and evidentiary rules are designed precisely to safeguard the integrity of such representation.[152] But accounting for an affected party's

151. *See* Stein, *The New Doctrinalism*, *supra* note 25, at 2090–92 (developing a "second-personal" account of evidence rules, modeling "adjudicative factfinding" as "a contest between the plaintiff's (or the prosecutor's) and the defendant's stories," in which legitimacy is defined, in part, by responsiveness to the affected party's version of events); *see also* STEIN, *supra* note 42 (developing these themes in greater detail). For further discussion, see David Alan Sklansky, *Anti-Inquisitorialism*, 122 HARV. L. REV. 1634, 1686 (2009) (identifying "meaningful participation by the defendant" and "respect for human dignity" as values rightly associated—at least in broad strokes—with the adversarial process).

152. *See, e.g.*, United States v. Stever, 603 F.3d 747, 755–57 (9th Cir. 2010) (overturning the trial court's evidentiary rulings that curbed a criminal defendant's access to evidence that would have supported an alternate theory of the known facts). This is certainly part of what underpins the Sixth Amendment right to counsel, as well as the Fifth Amendment right to exculpatory material, among other rights. *See* Strickland v. Washington, 466 U.S. 668, 691–92 (1984) ("The purpose of the Sixth Amendment guarantee of counsel is to ensure that a defendant has the assistance necessary to justify reliance on the outcome of the proceeding."); Brady v. Maryland, 373 U.S. 83, 87 (1963) ("Society wins not only when the guilty are convicted but when criminal trials are fair; our system of the administration of justice suffers when any accused is treated

perspective is not a value unique to adversarial settings. It also matters in unilateral and ex parte settings that require an adjudicator to decide, based on limited and indeterminate evidence, whether departure from the presumption of innocence is justified.[153] Even when an affected party is not privy to the proceedings, and has no opportunity to tell her side of the story directly, it is still important for the interpretive mechanism to be one that considers her side of the story, however imperfectly, in the process of adjudication.

Sometimes, all this will mean is that the state has offered facts that are probative of wrongdoing and admit of no innocent account.[154] Other times, it will mean that at least one plausible innocent account is available, but the state has built a strong enough case to tip the scales toward wrongdoing, all things considered.[155] Either way, the upshot is the same. A decision that takes the other side of the story into account, even in the course of rejecting it, is particularized in the sense that it is capable of *persuasion in the specific case.* Predictive decisions, by contrast, have a take-it-or-leave-it quality. When the Contraband Detector picks out "285 Court St., Apt. 2L" as suspicious, or an electricity usage algorithm indicates that a residence has outsized usage patterns, no further inquiry is possible. An observer may choose to follow the prediction or disregard it, but she has no way of *contextualizing* it—of asking whether, all things considered, the prediction seems more plausibly correct than not.[156]

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unfairly."). Interestingly, the principle also runs the other way—we think it important for the state to be able to tell *its* side of the story. *See, e.g.*, Old Chief v. United States, 519 U.S. 172, 189–90 (1997) (explaining that "the accepted rule that the prosecution is entitled to prove its case"—and cannot be forced, as a general matter, to accept a defendant's stipulation as to particular aspects of a crime—stems from the principle that "[a] syllogism is not a story").

153. Apart from law enforcement searches and seizures, another example that comes to mind is asset freezes, which can occur based solely on a probable cause finding by a grand jury, "without an evidentiary hearing" of any kind. Kaley v. United States, 134 S. Ct. 1090, 1101 (2014).

154. *See supra* Section II.A.

155. For example, when judges review warrant applications that primarily (or exclusively) depend on an informant's testimony, they will often examine the informant's history of reliability (or lack thereof) to determine if probable cause exists. In other words, judges will ask if another explanation—i.e., that the informant lied—is plausible. *See, e.g.*, United States v. Allen, 211 F.3d 970, 976 (6th Cir. 2000) (upholding a warrant issued based on testimony from a confidential informant who was "personally known to the detective who swore the affidavit," and whose "reliability in criminal matters in which the detective was involved had extended over a five-year period"). Indeed, this is the motivating principle behind the distinction between anonymous and non-anonymous informants. *See, e.g.*, Navarette v. California, 134 S. Ct. 1683, 1688 (2014) (explaining that an anonymous tip is much more likely to be unreliable because " 'ordinary citizens generally do not provide extensive recitations of the basis of their everyday observations,' and an anonymous tipster's veracity is 'by hypothesis largely unknown, and unknowable' " (quoting Alabama v. White, 496 U.S. 325, 329 (1990))).

156. Here, of course, the natural next question is what it would mean to contextualize the output of an algorithm, and what this contextualization suggests about its relative plausibility. That is a question I plan to take up in future work. L. Jonathan Cohen famously argued (and I

C. Governance Values

Apart from safeguarding the constitutional and rule-of-law values explored above, explanatory standards also serve three key governance values. First, they have salutary upstream effects: when officials know they may have to account for decisions later on, the decisions look different. Officials take greater care; they think twice.[157] In other words, the goal of explanatory standards is not simply to enable judicial oversight. It is also to make judicial supervision largely superfluous—by encouraging officials to take account of constitutional and rule-of-law values in the process of decisionmaking. A perfect system of oversight, after all, is one that never has to be mobilized, because its deterrent effect is that strong.[158]

Second, explanatory standards serve governance values by eliciting information about official conduct—a precondition of democratic and administrative pushback. Consider enforcement priorities. In the absence of explanations, it might be difficult to know which forms of wrongdoing police are opting to target. Suppose, for example, it turns out that in New York City, residences that contain illegal weapons are divisible into two distinct categories: first, residences where at least one occupant is connected to street crime; and second, residences where at least one occupant is a member of a pro–Second Amendment organization, like the NRA, with an ideological opposition to gun registration laws. In a legal sense, both residence-types are linked to the same offense—they involve violations of the same section of the New York criminal code—but, at a policy level, the offenses stem from very different causes and present distinct risks (and reasonable minds might disagree about which version of wrongdoing, in which contexts, is more important to combat).

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agree) that in many contexts, humans lack the computational capacity to perform true Bayesian analysis, given the sheer difficulty of putting new inputs meaningfully into analytic synthesis with background probabilities. *See* COHEN, *supra* note 25, at 93–115. If Cohen is right, it is unclear that complex algorithmic outputs *can* be meaningfully contextualized, given the dynamic reevaluation of variables that doing so would require. Naturally, what "complexity" means in this context is among the questions that need to be answered.

157. *See, e.g.*, Joanna C. Schwartz, *Myths and Mechanics of Deterrence: The Role of Lawsuits in Law Enforcement Decisionmaking*, 57 UCLA L. REV 1023, 1086 (2010) (discussing the effect of lawsuits as a deterrent on law enforcement actions and arguing that "more robust and effective information policies and practices can increase the impact of lawsuits on law enforcement behavior").

158. *Cf.* MICHEL FOUCAULT, DISCIPLINE AND PUNISH 195–228 (Alan Sheridan trans., Vintage Books 2d ed. 1995) (1977) (describing Bentham's panopticon as the perfect instrument of surveillance, because it does not even require surveillance to occur—the threat of surveillance is enough).

In a situation like this, would the Contraband Detector locate the first residence-type, the second, or both? The answer depends, of course, on the tool's training data. If the data reflects cases involving street crime, the tool will find the first residence-type; if the data reflects cases involving ideological opposition to gun registration, the tool will find the second residence-type; and if the data reflects both versions, the tool will find both. The problem is that from the bare fact of the tool's performance rate—eighty percent accuracy across cases—we do not know *which* cases the tool picks out. By itself, that is, an accuracy rate conveys literally nothing about the qualitative distribution of cases; the two issues run orthogonal. In a normative sense, however, we might care a good deal about the qualitative distribution of cases—since that distribution could end up defining enforcement priorities, at least to the extent that police are relying, in practice, on the Contraband Detector's guidance. Hence the importance of explaining the tool's outputs: bereft of an explanation, observers (whether regulators or members of the public) will have little idea about the enforcement priorities that have been effectively folded into the tool's operation.

Third, explanatory standards also yield information through time; that is, they encourage officials to explore and understand, instead of blindly capitalizing on, the insights of powerful machines. And this, in turn, helps ensure that our collective understanding of the world grows—instead of becoming stunted as more and more functions are delegated to machines.[159]

To take an innocuous example: suppose the Contraband Detector, unbeknownst to the officers using it, uncovers a strong correlation between drinking at least two cups of coffee a day and

159. In practice, of course, this also has to do with accuracy. In addition to its other pitfalls, blindly following algorithms, even highly reliable ones, sounds like a recipe for disaster—perhaps only a marginal disaster, perhaps only a sliver of cases will go wrong, but a disaster nonetheless. *See, e.g.*, PASQUALE, *supra* note 13, at 17 (positing that decisions made by companies using algorithms affect millions and that even small mistakes create "life-changing reclassifications"); Citron, *supra* note 18, at 1256–57 (enumerating examples of algorithmic governance tools that have been prone to error, including (1) "benefit management systems" that have issued "hundreds of thousands of incorrect Medicaid, food stamp, and welfare eligibility determinations"; (2) algorithms meant to locate " 'dead-beat' parents who owe child support" that sweep in many non-offenders, triggering automatic garnishment of wages; and (3) counterterrorism tools that, due to "unsophisticated algorithms and faulty data," end up "generat[ing] high rates of false positives" with grave law enforcement consequences). For a more lighthearted example along these lines, see Bruno Waterfield, *GPS Failure Leaves Belgian Woman in Zagreb Two Days Later*, TELEGRAPH (Jan. 13, 2013, 3:32 PM), http://www.telegraph.co.uk/news/worldnews/europe/belgium/9798779/GPS-failure-leaves-Belgian-woman-in-Zagreb-two-days-later.html [https://perma.cc/Z5F4-QABX] (detailing the tragicomic story of Sabine Moreau, a Belgian woman attempting to drive to Brussels, but whose GPS instead led her to Croatia—more than twenty times the distance she intended to travel).

certain forms of white collar crime. If no one is required to develop explanations, and searches proceed on the strength of the tool's outputs alone, this connection may go undiscovered. Police officers primarily care about catching criminals, not demystifying criminal behavior. And even in a world of explanations, of course, it may be that the connection between coffee and criminality has no deeper significance. Coffee consumption may just be a proxy variable for other, more familiar predictors of criminality, like depression.

But suppose, for argument's sake, that coffee intake *is* linked to criminality—say, because caffeine has a heretofore unknown effect on impulse control. Surely, this connection is something that we, as a polity, would like to know. In part, we would like to know about the connection because it stands to improve law enforcement. But we also might want to know about it for other reasons.[160] Maybe we want to regulate caffeine intake. Maybe we want to launch an educational campaign warning young people against caffeine's dangers. And so forth; the point is that no necessary connection exists between the governance sphere where an insight initially surfaces and the sphere where it ends up being most relevant. And the value of explanatory standards, in this light, is that they encourage insights to surface—they create incentives for institutional actors, including but not only police, to understand the tools they employ, which has salutary effects on the governance system as a whole.

V. JUDICIAL PRUDENCE IN THE AGE OF POWERFUL MACHINES

Alexander Bickel is an uneasy hero today. While most agree that he made some important contributions to constitutional theory, including coining the term, "counter-majoritarian difficulty," Bickel is famous, first and foremost, for combating the progressive impulses of the Warren Court and for extoling the virtues of judicial "passivity"[161]—achievements that, in retrospect, have an ambivalent cast at best.

At the core of Bickel's thinking, however, lies an important concept, indeed one that arguably shaped the entirety of his work: prudence.[162] In Bickel's view, a prudent person—and likewise a prudent judge—grasps the difficulty of decisionmaking within "complex,

160. Recent revelations about the link between lead paint exposure and criminal propensity provide a real-world analogy here. *See, e.g.*, James J. Feigenbaum & Christopher Muller, *Lead Exposure and Violent Crime in the Early Twentieth Century*, 62 EXPLORATIONS ECON. HIST. 51 (2016).

161. *See* Anthony T. Kronman, *Alexander Bickel's Philosophy of Prudence*, 94 YALE L.J. 1567, 1568 (1985) (discussing what Bickel is known for).

162. *See id.* (arguing that prudence is the underlying concept shaping Bickel's work).

historically evolved institutions,"[163] approaches normative problems with "measure[d] . . . balance and judgment,"[164] and is comfortable, above all, "liv[ing] with the disharmony between aspiration and historical circumstance."[165] Thus, prudence is "the antithesis of principle."[166] But by this, Bickel did not mean that prudential judgment is delinked from thoughtful conviction; he meant that when values collide, there is no formula for deciding which value to prioritize. The decision must come back to "practical wisdom."[167]

This notion of prudence, as advocated by Bickel and developed by others,[168] is typically associated with questions about the proper role—often a limited one—of courts. Bickel's main example of an ostensible "principle" that, on closer inspection, turns out to be a matter of prudence was the political question doctrine,[169] the lodestone of separation of powers law. Likewise, the only place the concept shows up in existing law is the "prudential" use of justiciability principles, such as standing, mootness, and abstention, to regulate the scope of judicial power.[170]

Yet nothing in the conceptual fabric of prudence confines it to the realm of separation of powers. At its core, the virtue is more general; it is about the limits of reason in the face of normative complexity. To say that a problem is best resolved by prudence rather than principle is to express doubt about the possibility of fashioning second-order rules for navigating the collision between first-order values. Prudence becomes important, in other words, to the extent that conflict between competing goods is hard to reduce to fixed equations. When that happens, case-specific judgments—as opposed to generalized principles—must carry the day.

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163. *Id.* at 1569.

164. ALEXANDER M. BICKEL, THE MORALITY OF CONSENT 137 (1975).

165. Kronman, *supra* note 161, at 1570.

166. ALEXANDER M. BICKEL, THE LEAST DANGEROUS BRANCH: THE SUPREME COURT AT THE BAR OF POLITICS 133 (1962) ("The antithesis of principle in an institution that represents decency and reason is not whim or even expediency, but prudence.").

167. BICKEL, *supra* note 164, at 23.

168. *See, e.g.*, Bruce G. Peabody, *Legislating from the Bench: A Definition and a Defense*, 11 LEWIS & CLARK L. REV. 185, 210 (2007) (defining the judicial prudence school as a "tradition of legal research argu[ing] that judges are most effective when they carefully husband their institutional resources, including their prestige and capacity to imprint and confront salient controversies in public affairs"); *id.* at 191 n.22 (compiling examples of congressional limitation on judicial power).

169. *See* BICKEL, *supra* note 166, at 183–98 (discussing principles underlying political question doctrine).

170. *See, e.g.*, Mark Tushnet, *Law and Prudence in the Law of Justiciability: The Transformation and Disappearance of the Political Question Doctrine*, 80 N.C. L. REV. 1203, 1214–22 (2002) (discussing the "doctrinalization" of standing law and its tension with political question doctrine).

Automation as an enterprise depends on the rejection of prudence. Automating judgment would require the conflict between competing goods to be expressed formally; we would need to be able to discern, with at least rough certainty, the correct balance to strike between values—so we may design our machines accordingly.[171] Thus, a proponent of automation might reasonably ask: *Even if the values explored in the last Part do, indeed, trade off accuracy, could we not train machines to navigate the tradeoff?* The answer turns, of course, on what navigation of the tradeoff entails, and, more specifically, on whether the relationship between competing values is knowable, in a generalizable way, before the fact.

It was precisely here—regarding the capacity of general principles to resolve specific collisions of value—that Bickel was skeptical. In his view, the resolution of tradeoffs depends on the felt necessities of circumstance, necessities that only make themselves known in the context of specific cases. And, just as before, the division between prudence and principle does not mean that prudence, as a faculty, is unmoored from conviction or reflection. It means simply that the results of prudential judgment are not easily generalized, and thus not readily translated into a form—whether a doctrinal test, or a string of computer code—that can be applied, down the line, in automatic fashion.

Is there a formula for how tailored the police use of associational data must be to assuage First Amendment concern? Or the many ways in which consideration of race in law enforcement and elsewhere may serve compelling state interests? Or the degree of advanced notice required to make policing genuinely *lawful* rather than arbitrary? A full answer to these questions lies beyond the scope of this Article; it presents issues long-debated in computer science and philosophy departments and would no doubt take many volumes to fully disentangle.

At some level, however, the broad conceptual question—do these formulae exist in principle?—can be sidestepped in favor of a more practical conclusion. Even assuming, arguendo, that the formulae do exist, automating them would require humans to express them in formal terms—and this, by itself, would be quite a task. Looking back over the history of constitutional jurisprudence, and, in a sense, the entire history of the common law, should make one think twice about how susceptible legal judgment actually is to automation, especially in areas of normative dispute and multiplicity.

171. *See generally* WEIZENBAUM, *supra* note 11.

If sound judgment were reducible to analytic dexterity—if it were simply the product of intelligence—then machines, presumably, would have little difficulty taking the reins. There can be little doubt, in the long run, that computational systems will prove more intelligent (in this limited sense) than humans. The problem, however, is that intelligence and soundness of judgment are not the same thing. In the face of value-pluralism, the judge's claim to expertise is not superior intellect, but practical wisdom. It is a claim, as Holmes famously put it, about *experience*, not reason.[172]

CONCLUSION

The Supreme Court has long required police to offer case-specific theories of wrongdoing before intruding on private life; assurances of predictive accuracy, standing alone, will not do. In the past, the rationale for this practice was simple: explanations helped keep suspicion decisions (roughly) accurate. While that rationale may not survive the rise of power machines, the need for explanations persists. Why are some of us and not others subject to the searching gaze of the state? Explanations are what allow us to answer this question consistently with our values—through legislation, administrative rulemaking and, just as importantly, case-specific review by judges.

The era of automation approaches swiftly—and with obvious allure. Judgment is a fragile enterprise, often a source, as Professor Owen Fiss once wrote, of "agony."[173] It will surely be tempting, as it becomes more practicable, to entrust our fates to the power of computation rather than the wisdom of judgment. The trouble is that in some domains, judgment is necessary—not because it guarantees statistical perfection, but because it keeps the exercise of power intelligible and ensures that arenas like law enforcement, riven as they are with value-pluralism, maintain some measure of balance.

The last decade, and especially the last handful of years, has made painfully clear what happens when wide swaths of our polity come to regard the police as a foreign presence, akin to an occupying force. By requiring officials to explain why they believe invasions of privacy are justified, the Fourth Amendment's "plausible cause"

172. OLIVER WENDELL HOLMES, JR., THE COMMON LAW 1 (Dover Publications reprt. 1991) (1881) ("The life of the law has not been logic: it has been experience."); *see also* RICHARD A. POSNER, REFLECTIONS ON JUDGING 354 (2013) (arguing that judging is "one of the simplest professional fields," and that success is ultimately about pragmatic reasoning, not intelligence or theoretical sophistication).

173. *See* Owen M. Fiss, *Against Settlement*, 93 YALE L.J. 1073, 1086 (1984) (describing settlement and ADR as tempting ideals, insofar as they allow judges—and all of us, as members of a democratic society—to avoid the "agony of judgment").

standard will not necessarily make policing more precise. In fact, in the face of new technology, it may well do the opposite. But it will also vindicate a core promise of constitutional democracy: that governance is an outcome of popular sovereignty. That state power is an instrument we wield, however imperfectly, together—not something thrust upon us from without.

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